BULLETIN OF MISCELLANEOUS INFORMATION No. 2 1933
ROYAL BOTANIC GARDENS, KEW

XI—THE FLORA OF MOUNT ELGON.

The somewhat condensed form adopted in the enumeration of plants was dictated by the desire to include both Major Lugard's introduction and the list in a single issue of the Bulletin. It is hoped that the present number will serve as a handy reference book on the Elgon Flora for residents in Kenya and Uganda. A. W. H.

General Introduction.

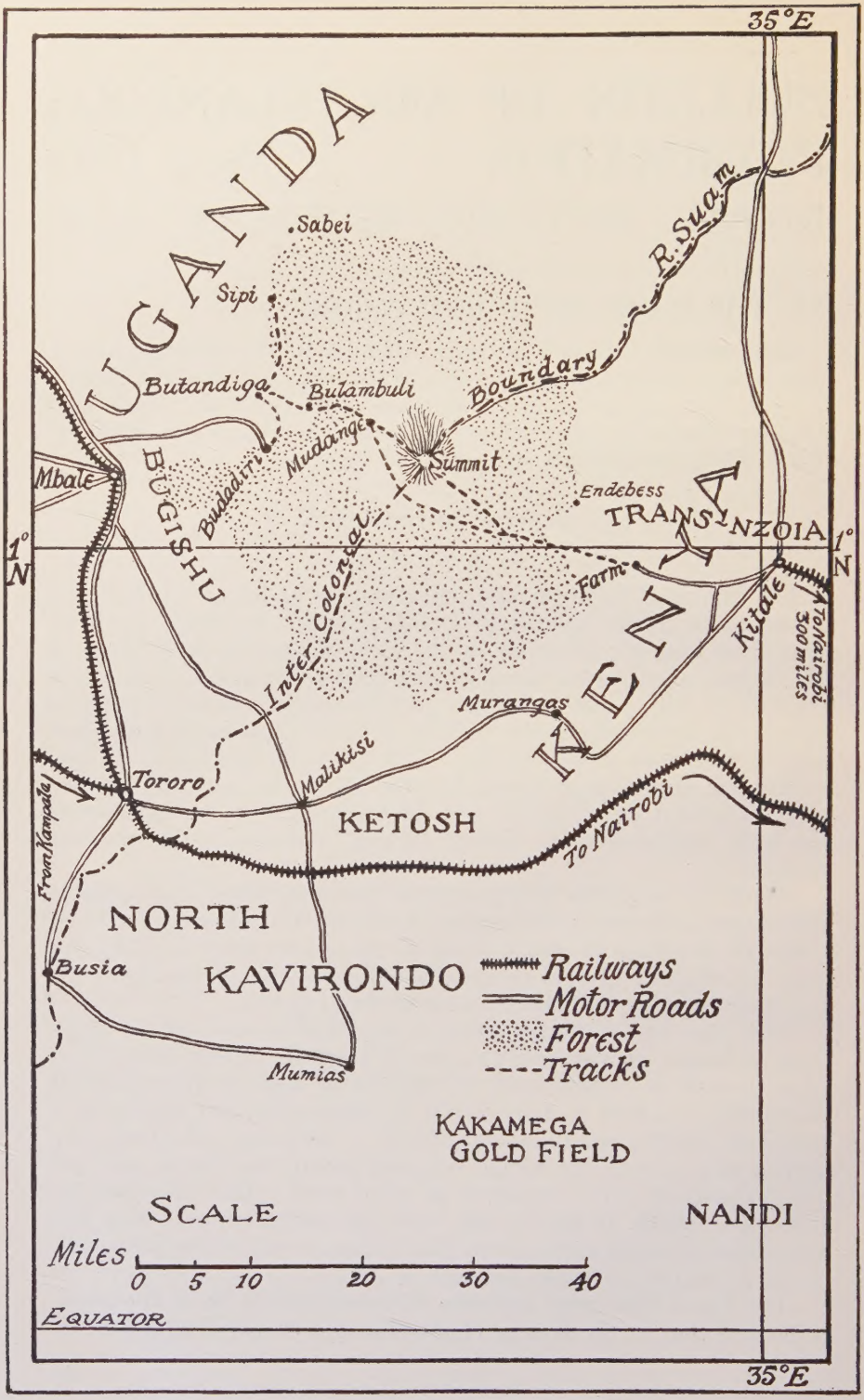
E. J. LUGARD.

The botanical collection (an enumeration of which follows) was made between the months of October, 1930, and May, 1931, by Mrs. Cyril Lugard and myself on the south-eastern (Kenya) slopes of Mt. Elgon, at altitudes varying from 6000 to nearly 14,000 ft. It consists of 649 species, of which 36 (and possibly more) are new or previously undescribed, and includes a small supplementary collection of trees and shrubs by Mr. T. H. E. Jackson, and also a few additional specimens gathered by Mrs. D. R. Tweedie and by my son, Captain Cyril Lugard, and his wife in two recent ascents specially undertaken to collect further material of arborescent Senecios.

With the exception of a few of the beautiful ferns, a remarkable lichen and a club-moss, we confined ourselves to the flowering plants. Coloured drawings of eighty-seven of the species were made by my wife, for which the Royal Horticultural Society was pleased to award her the Silver Grenfell Medal in November, 1931.

Our base was my son's coffee-farm, which is situated 18 miles west of Kitale, on a spur of the mountain at an altitude rising from 6500 to 7200 ft. With such an interesting field as an equatorial mountain, I judged it more useful to concentrate our efforts on a relatively small area than to attempt a desultory collection over such a vast country as Kenya, varying greatly in climate and soil and in altitude from sea-level to snow-level. The collection is, therefore, strictly localized, and, with the exception of a very few specimens gathered within a ten-mile radius, it was made exclusively on the mountain or on the foothills.

The Elgon flora, may, however, be considered to be, in the main, typical of that of the Kenya Highlands at corresponding altitudes.



Sketch map showing the position of Mount Elgon.

The following is a general description of the locality :—

Physical Features.

Mt. Elgon (also called Masaba or Masawa) lies approximately on the intersection of Lat. 1°N. and Long. 34½°E. Its highest peak is said to be 14,178 ft. and is only surpassed in Central Africa by Kilimanjaro (19,720 ft.), Mt. Kenya (17,040 ft.), and Ruwenzori (16,794 ft.). But her taller sisters are all snow-capped, while the summit of Mt. Elgon just fails to reach the line of perpetual snow (15,500 to 16,000 ft., according to aspect), and is therefore rarely snow-covered, and, even then, the snow seldom lasts for more than a few hours. Dummer, however, records that a three-inch fall of snow impeded his progress considerably (2).*

Although Mt. Elgon has to-day no ice-cap, it has a series of three old moraines, the remains of the Pluvial period when the snow and glacier level descended to the 10,000 ft. contour (15).

Mt. Elgon is perhaps the largest extinct volcano in the world, the crater measuring eight miles in diameter and said to be 1500 to 2000 feet in depth. In the latest survey three peaks are said to be over 14,000 ft. The crest of the massif forms the boundary between Kenya and Uganda ; its base is about 150 miles in circumference. The lower slopes are somewhat precipitous on the north, west and south ; Johnston describes " the tremendous buttresses and precipitous cliffs of gleaming granite or quartz or dark basalt " (14). On the east the spurs fall more gradually to the Trans Nzoia plain. Steep spurs separated by narrow ravines run out from the mountain ; these ravines are traversed by a great number of streams which flow north-west and west through Lake Kioga to the Nile, and south and south-east to the Victoria Nyanza, while on the north-east the Suam River rises in the crater, out of which it cuts its way through a magnificent gorge, and, with many tributary streams, forms the Turkwell River flowing into Lake Rudolf. The ascent of the mountain involves no mountaineering skill ; anyone sound in heart and limb can ascend to the summit, though the last few hundred feet involve some scrambling among precipices and imposing rock-pinnacles. Dummer's companion, MacLennan, suffered, however, so acutely from mountain-sickness that he " wished to lie down and die ! " (2). The rarefied air at 13,000 to 14,000 ft., with a cutting east wind and the fierce rays of the equatorial sun, renders the ascent toilsome over the " tussocky " grass (*Festuca abyssinica*) and silver-leafed scrub (*Alchemilla argyrophylla*) of the mountain meadows even in the dry season, while during most of the year the meadows are a bog ! It is too hot to rest in the sun, and too cold to rest in the shade. It would seem that few attempt the ascent, for, on the peak which I climbed, I found records of only 28 names in the last 14 years.

Mt. Elgon was first sighted in the distance by Stanley in 1875, while sailing on Lake Victoria ; he estimated its height at 7000 ft ! (19).

*For references see p. 58.

The real discoverer of Mt. Elgon was Joseph Thomson in 1883, who was the first European to visit the mountain and to describe the caves for which it is famous. From time immemorial these caves have been inhabited by man. They are very extensive and honeycomb the mountain. When first discovered many contained large villages and herds of cattle, with deep lakes of fresh water in their recesses. It has been much debated whether the caves are natural or made by man. Thomson, a trained geologist, was confident that they were of artificial origin. "The caves," he writes, "bore incontestible evidence on the face of them that they had neither a natural nor supernatural origin. They must have been excavated by the hand of man. That was a fact about which there could absolutely be no two opinions." "Looking at everything," he adds, "I can come to but one conclusion, and that is, that in a very remote era some very powerful race, considerably advanced in arts and civilization, excavated these great caves in their search for precious stones or possibly some precious metal. However improbable this theory may seem, it is the only one which suggests itself to me after months of cogitation" (21). Major Powell-Cotton found chisel-marks, and considered the caves "wholly artificial" (16), and others maintain that they have been, and are still being, excavated for rock-salt for cattle.

On the other hand, since they occur in the lava as well as in the conglomerate, later opinion considers them natural—vast blowholes of the extinct volcano. Jackson says "it is difficult to imagine them the work of man" (12); Hobley, a geologist, considers them "undoubtedly due to natural causes and excavated by water" (8), and Purvis "has not the least doubt that the caves were originally natural, but have been enlarged" (17). Finally, the late Professor Gregory, whose high reputation as a geologist lends exceptional weight to his opinion, after reviewing the evidence, is inclined to consider that the caves are "ordinary natural caverns, though they may have been artificially enlarged and modified" (6).

They are mostly situated on the southern face at the base of the mountain, but some are found at high altitudes; my porters sheltered in one at nearly 12,000 ft. Some are still inhabited, but the *Pax Britannica* has induced the natives to live in the open. Fleas and filth do not invite a close inspection of their recesses; Woodhouse tells of two caves abandoned even by the natives owing to the millions of fleas in them! (24).

Jackson and Gedge were the first Europeans to reach the summit in 1890. Mt. Elgon is known as Masawa to most of the local inhabitants. The word Elgon appears to be an abbreviation of the Masai name, meaning "the mountain of breasts" (3).

The Climate.

The lower slopes of the mountain on the eastern (Kenya) side afford a delightful climate for Europeans, whose farms on the foothills between 6500 and 7000 ft. grow coffee, maize and wheat—the

volcanic soil, locally known as " mountain soil," being especially suitable for coffee. Here, practically on the Equator, it is never too hot and never too cold, and, except perhaps for a few nights in the driest months, one can enjoy a blazing log-fire every evening in the year, and three blankets at night. There are fewer mosquitoes and other insect pests than in England, but against this immunity must be set the painful attentions of the jigger flea !

The gardens, frost-free, grow all the choicest flowers and vegetables of an English garden, as well as those of the sub-tropics, in wild luxuriance for the greater part of the year, " the dull season " being the dry months from December to February. The heaviest rainfall is from April to November, with breaks in June and October, with an average of 45 to 50 inches in the year. At similar altitudes on the western (Uganda) side the climate is moister, with a rainfall of over 60 inches, and the slopes are densely covered with banana-groves. At higher altitudes the rainfall is probably much heavier, but no records have been taken. Frost may be expected at night above 10,000 ft., while on the mountain meadows, from 12,000 ft. upwards, the bitter wind and the rarefied air are very trying by day, and the cold at night is intense. Two of Jackson's porters perished from cold when he crossed the summit in 1890 (12).

The Natives.

The natives to the south and west of the mountain belong to the Bantu (Kavirondo) group ; Johnston describes a remarkable concentration of Bantu-speaking tribes on the western flanks, clans of the Bagishu, who speak the most archaic forms of the Bantu language, which " may perhaps claim to be the nearest living approach to the original Bantu mother-tongue " (14). They are among the lowest of East African tribes, and, until recently, practised cannibalism. Johnston adds that " the resemblance of the dwarf types in West Elgon to the Congo Pygmies is unquestionable " (14). South of Mount Elgon lies the Ketosh Reserve, and of the many small tribes living on the foothills to the south and west described by Hobley (8), some are an offshoot of the Ketosh, some are of Kavirondo stock, and others are allied to the Nandi (9). The eastern foothills, now occupied by European farms, were devoid of inhabitants, save for wandering parties of hunters, when Hobley traversed the area in 1896 (8). A tribe locally known as the Elgon Masai, who are entirely pastoral and never cultivate the soil, have villages of rectangular, flat-roofed huts at altitudes of over 10,000 ft., and graze their cattle on the mountain meadows. They are, perhaps, a remnant of the Uasin-gishu Masai who, after their defeat by the Masai of the Rift Valley many generations ago, were " scattered in all directions in small lots, and formed colonies by themselves " (12).

The Fauna.

Mammals. The mammals of Mt. Elgon are discussed in detail by Dr. Granvik (5). Of the larger mammals still found on or close

to the mountain, elephant are in large numbers and do much damage to crops on the lower slopes ; lion had raided the cattle at Sangula's Village (10,000 ft.) just before my visit. Buffalo, leopard and cheetah are common, and giraffe are still found in the neighbourhood, but the rhinoceros is now thought to be extinct on the mountain. Of the larger antelope, the local species of waterbuck (*Kobus defassa Nzoiae*), Roan, and Jackson's hartebeest are plentiful, as also are bushbuck and reedbuck. Of the smaller antelope, oribi, steinbuck and duiker are very numerous ; the last-named nightly raid the gardens, having, it would seem, developed an especial taste for strawberry plants and rose bushes. The small " green " monkey (*Cercopithecus aethiops centralis*) does much damage to the maize crop ; the Colobus (*Colobus polykomos matschiei*) and the " blue " monkey (*Cercopithecus leucampyx stuhlmanni*) are also common on the mountain. My porters secured a hare at about 12,000 ft. Some interesting mammals, including a new mole discovered by Foster, have been described recently.

Birds. Below 8000 ft., especially on the foot-hills, there is a great variety of bird life. Of game birds, there are at least five species of francolin, including the rare Elgon Francolin (*Francolinus shelleyi elgonensis*) ; some species are found even up to an altitude of 13,500 ft. There are many species of pigeons and doves, including the handsome Speckled Pigeon (*Columba guinea*), of which there is an illustration in Johnston's book (14). Ellenbeck's Decorated Sand-Grouse (*Pterocles decoratus ellenbecki*) is found in south Elgon. The Saw-winged Swallows (*Psalidiprocne massaica*) nest in the caves up to 8000 ft. Above that altitude, in the heavy forest or on the mountain meadows, there is very little bird life. Jackson says a little Chat (*Pinarochroa hypospodia*), a warbler (*Cisticola hunteri masaba*), both confined to the high alpine zone, and a Sunbird (*Nectarinia*) were the only birds he encountered (12). Dr. Granvik found the Ethiopian Snipe (*Capella nigripennis*) at 13,000 ft., and the Black Duck (*Anas sparsa*) on the icy-cold crater-lakes at 13,800 ft. ! (13).

A list of the birds found in West Elgon and district has been published by Dr. van Someren (23). Colonel H. F. Stoneham has given me the following list of birds as typical of Elgon and the surrounding district :—

Ligony's Grass Warbler (*Cisticola hunteri masaba*).
Grey-chin Sunbird (*Anthreptes tephrolaema elgonensis*).
Square-tailed Drongo (*Dicrurus ludwigii elgonensis*).
Golden-breasted Eremomela (*Eremomela pusilla elgonensis*).
Elgon Francolin (*Francolinus shelleyi elgonensis*).
Oriole-Finch (*Linurgus kilimensis elgonensis*).
Chestnut-winged Starling (*Onychognathus walleri elgonensis*).
White-starred Bush-Robin (*Pogonocichla stellata elgonensis*).
Yellow-billed Barbet (*Trachylaemus purpuratus elgonensis*).

Insects. On the western slopes the tropical forests extend up to about 6000 ft. and abound in insect life. Above that altitude a

gradual change to that typical of the higher forests—which becomes more marked at 8000 to 9000 ft.—is observable.

Seven species of mosquitoes have so far been recorded, including, at 6000 to 7000 ft., some which are not found in tropical Uganda. *Anopheles kingi* appears to be a mountain species restricted to a cool climate, since it was originally described from the Livingstone Mountains in the south-west of Tanganyika. *Culex hancocki*, the interesting larvae of which have been described by Hopkins (10), is met with at 9000 ft. in bamboos which have been bored by caterpillars. Many of the smaller forms of life in the higher zones have been the object of study by the Swedish Elgon Expedition (18), to which the researches of Hancock and Soundy have contributed further data (7). The many species of weevils are of particular interest, and include some found on giant-groundsel. An undescribed longicorn has been found in logs of tree-heath. Uvarov (22) has described a grasshopper with short wings—a character not uncommon among species from high mountains—and various species of saw-flies have been found at these higher altitudes. Some interesting forms of minute aquatic life occur in the tarns, including a water mite. The water fleas show some affinity with those of Abyssinia and South Africa. A great variety of lepidoptera is to be found in the foothills, but at altitudes of 11,000 ft. and upwards Sir F. Jackson found but few butterflies on the mountain meadows, and those only in sheltered and sunny spots, including the small fritillary (*Argynnis hanningtoni*), the ubiquitous Painted Lady (*Pyrameis cardui*) and a very small new "blue" (*Cupido aequatorialis*) (12). Mr. T. H. E. Jackson recently captured the latter and also *Zizera stellatus* at nearly 14,000 ft. Among butterflies peculiar to the district Colonel Stoneham mentions *Teracolus elgonensis* and *Belenois victoria dixeyi*. Bryk named a melanistic variety of *Papilio mackinnoni* as *elgonia*.

The Flora.

The flora of Mt. Elgon has been much explored. The first collection to reach Kew was that of J. D. Snowden in 1916, and R. A. Dummer in 1918 made a considerable collection, 35 per cent. of which were Cryptogams, mostly mosses and lichens (2). Important papers on the flora have been published by the distinguished brothers, Professors Robert and Thore Fries. More recently, Messrs. Gardner, Hancock, Soundy, and Honoré have made valuable collections, which include a striking, gladiolus-like plant of a new genus, *Oenostachys dichroa*.

The flora is fairly typical of the Equatorial mountains of East and Central Africa. Broadly speaking, we may recognize three "zones of vegetation," which, however, merge into one another and vary much in altitude according to aspect :—

(*a*) *The Sub-montane zone*, from 6000 to 7500 ft.
(*b*) *The Mountain Forest zone*, from 7500 to 10,300 ft.
(*c*) *The Alpine zone*, from 10,300 to 14,000 ft.

Dummer, however, considers that " phytogeographically Elgon falls into six zones " (2), while the great German botanists, Engler and Volkens, distinguish four or five zones or " regions " in describing Kilimanjaro.

(*a*) The Sub-montane Zone. On the lower slopes and foothills from 6000 to 7500 ft. the country is open and " park-like," with scattered trees and grass-lands, much of which is now under cultivation. The most numerous trees are various species of *Acacia*, especially the flat-topped *A. abyssinica* which reaches a height of 30 feet. The banks of the streams, however, are generally fringed with heavy sub-tropical forest, in which are found the wild " Nandi coffee " (*Coffea eugenioides*) remarkable for its low percentage of caffeine (11), and the wild banana, the fruit of which is not edible. Of the great variety of beautiful flowers to be found at these lower altitudes, I may mention the gorgeous *Gloriosa virescens* ; the brilliant scarlet *Haemanthus multiflorus* ; two " Crinum lilies " (*C. Kirkii* and a new species *C. heterostylum*) ; the scarlet gladiolus (*G. Quartinianus*) which varies greatly in colour at different altitudes from 6000 to 11,000 ft. ; three very striking species of " Arum lilies " (*Araceae*) ; countless thousands of the delightful little " iris " (*Morea Thomsoni*) ; many species of orchids, mostly terrestrial ; a large white pelargonium (*P. multibracteatum*), in leaf and size of flower closely resembling the scarlet " geranium " of English gardens ; a magnificent white balsam (*Impatiens elegantissima*) ; several showy species of *Pentas* ; the tall blue-green delphinium (*D. macrocentron*) extending from 6000 to 12,000 ft. and becoming bluer as the altitude increases, a characteristic of the " forget-me-not " ; many striking composites, especially *Coreopsis coriacea* ; a large number of beautiful Hibiscus, and endless species of the pea family. There are many handsome flowering shrubs, including the beautiful blue *Clerodendron ugandense*, and two species of *Acanthus*—the fine blue *A. eminens*, growing only in dense forest-shade, and the pink *A. pubescens* which is found only in open country. There are many species of St. John's Wort (*Hypericum* spp.), from tiny trailing plants (*H. peplidifolium*) to trees 20 feet in height with flowers two inches in diameter (*H. lanceolatum*). Many brilliantly coloured parasites (*Loranthus* spp.) grow on the trees, some of enormous size which often destroy their host. Of the trees the *Acacia*, the *Dombeya* and, above all, the brilliant scarlet *Erythrina tomentosa* make a great display in their season. The flora on the western (Uganda) slopes at the lower altitudes, where the rainfall is greater and the climate moister, is of a more tropical character, and to some extent approximates to that of West Africa (14).

(*b*) The Mountain Forest Zone, which includes the bamboo belt and grass glades. This zone may be said to extend roughly from 7500 to 10,300 ft., but varies greatly. The most valuable timber is " podo " (*Podocarpus milanjianus* and *P. gracilior*), used throughout the country by Europeans as a substitute for deal, and

the " pencil-cedar " (*Juniperus procera*) ; I camped under specimens of the latter measuring 20 ft. in girth and over 100 ft. in height. The " podo " are of great size, growing to 80 ft. in height with a girth of 25 ft. Many of the trees are festooned with streamers of lichen (*Usnea longissima*) over 3 ft. in length. Bamboo (*Arundinaria alpina*) occurs in extensive belts between 8000 and 9000 ft., but not as " pure forest " as on Mt. Kenya. Of the scores of species of bamboo growing all over the world in tropical and semi-tropical regions, it is remarkable that this is the only species found on the Equatorial mountains of East Africa. The common bracken (*Pteridium aquilinum*), though found as low as 6500 ft., grows most freely between 8000 and 9000 ft.

(*c*) The Alpine Zone, 10,300 to 14,000 ft., known as the " mountain meadows." It is mostly in this zone that we meet with the giant forms of many plants which in most countries attain only a low growth, e.g., tree-groundsels, tree-heaths, giant lobelias, and tree-hypericums. The only forest trees in this zone are the handsome *Hagenia abyssinica*, growing to 30 feet and carrying a remarkable rosy-pink plume-flower, and the tree-heath (*Erica arborea*), of which the finest specimen that I saw was some 20 feet in height and measured 11½ ft. in girth. From 11,000 to 14,000 ft. those extraordinarily interesting plants, the tree-groundsels (arborescent *Senecio* spp.) are found. They grow to the size of apple-trees, and only occur on the Equatorial African mountains. The species peculiar to Mt. Elgon have been fully described recently in an article by Mr. A. D. Cotton (1).

The many species of *Lobelia*, found from 6000 to nearly 14,000 ft., vary from *L. Giberroa*, which grows to a height of 30 ft. with a flower spike of 6 ft., to *L. Lindblomii*, which is no more than half an inch in height. The giant lobelias are also found in South India, Hawaii, and South America.

A large number of beautiful flowers are to be found on these mountain meadows ; acres of " everlastings " (*Helichrysum*) of many species which vary in height from nine inches to ten feet, and in colour from white or yellow to pink and terra-cotta ; masses of " red-hot pokers " (*Kniphofia Snowdenii*) ; " wand-flowers " (*Dierama vagum*) ; a delightful little crocus-like plant (*Romulea ramiflora*) and two beautiful little Swertias (*S. uniflora* and *S. Lugardae*), which would be well worth introducing to English rock gardens. The sheets of colour, however, are not comparable with those of the alpine meadows of Europe.

I am very greatly indebted to Mr. A. A. Bullock and other members of the Staff of the Kew Herbarium for the trouble they have taken in determining the specimens ; to Mr. Juxon Barton of the Kenya Secretariat, to Mr. G. L. R. Hancock of the Uganda Agricultural Department, to Colonel H. F. Stoneham of the Stoneham Museum, Kitale, and to Mr. T. H. E. Jackson of Kapretwa, Kitale, for much valuable information and help.

The following authorities have been freely consulted :—

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Enumeration of Plants.

A. A. Bullock.

Numbers which are not preceded by a collector's name refer to specimens collected by Major E. J., Capt. Cyril, and Mrs. Cyril Lugard. There is only one series of numbers for these three collectors, but, as stated in the general introduction, the great majority of the specimens was collected by Major E. J. and Mrs. Cyril Lugard.

The numbers referring to specimens collected by Mr. Jackson and Mrs. Tweedie are preceded by the name of the collector.

Notes on the distribution of the species are necessarily brief, owing to the condensed form of the enumeration, and some explanation is called for. The term " East Africa " in this list includes Eritrea, Somaliland, Abyssinia, Kenya Colony, Uganda Protectorate, and the Mandated Territory of Tanganyika. " Kenya " as distinct from " Kenya Colony " indicates that Mt. Kenya only is referred to. The vast majority of the species are montane in distribution, and the names of the mountains on which they are known to occur are usually written out in full. The short descriptive phrase following each species is based on Major Lugard's field notes.

Space does not permit a phytogeographical analysis, and since not more than two-thirds of the plants known from the mountain are included, this is scarcely desirable.

The 36 new or previously undescribed species, together with 5 new nomenclatural combinations, have been published in two previous papers in the Bulletin (*K.B.* 1932, 465, 487), and are indicated in the following enumeration by asterisks.

In addition to the acknowledgments for advice and assistance in the previous paper, the writer is indebted to Mr. G. Taylor of the British Museum (Natural History) for assistance in naming the Labiatae.

The following groups have been named by other members of the Kew Staff : Pteridophyta (Mr. F. Ballard), Orchidaceae (Mr. V. S. Summerhayes), Cyperaceae (Mr. E. Milne-Redhead), and Gramineae (Mr. C. E. Hubbard).

The arrangement of families follows the system proposed by Mr. J. Hutchinson in his book " Families of Flowering Plants," the second volume of which is shortly to be published.

Pteridophyta. (F. Ballard.)

Filices.

Polypodiaceae.

Polystichum.—*P. aculeatum* (Linn.) Schott ; about 4 ft., no. 339 ; cosmopolitan. *P. aculeatum* var. *stenophyllon* R. Bon. ; 13,000 ft., no. 687 ; Kenya Colony.

Nephrolepis.—*N. cordifolia* Presl ; 6200 ft., erect to 4 ft., no. 285 ; tropics of the Old World and Australasia.

Asplenium.—*A. adiantum-nigrum* Linn. ; 12,600 ft., about 1 ft., no. 335 ; high altitudes in Tropical and South Africa, and in Europe, Asia, Hawaiian Is. *A. anisophyllum* Kunze ; erect to 2 ft., no. 309 ; Tropical Africa and America. *A. brachypteron* Kunze ; 6500–7000 ft., erect, 9 in., no. 296 ; Tropical Africa. *A. monanthes* Linn. ; erect to 14 in., no. 310a ; Tropical and South Africa, Atlantic Is., Tropical America, Hawaii. *A. praemorsum* Sw. ; 6500 and 13,000 ft., viscid, erect to 9 in., nos. 225 ; 688 ; tropics and subtropics of both

hemispheres. *A. theciferum* Mett. ; 6500 ft., erect to 9 in., no. 227 ; Tropical and South Africa and South Tropical America. *A. abyssinicum* Fée ; to 18 in. high, no. 354 ; East Africa, Cameroons Mt., Fernando Po, and in Nyasaland.

Pellaea.—*P. hastata* (Thunb.) Prantl ; 6500 ft., alongside rocks, erect to 14 in., no. 226 ; Tropical and South Africa, Himalaya. *P. quadripinnata* (Forsk.) Prantl ; 8550 ft., about 4 ft., no. 340 ; Tropical and South Africa.

Cheilanthes.—*C. farinosa* (Forsk.) Kef. ; 6500–7000 ft., erect, 15 in., no. 295 ; tropics of the Old World.

Adiantum.—*A. aethiopicum* Linn. ; 6500 ft., erect to 3 ft., no. 221 ; Tropical and South Africa, Australasia.

Pteris.—*P. cretica* Linn. ; 6500 ft., erect to 2½ ft., no. 224 ; tropics of the Old World and Polynesia, and in the Mediterranean Region. *P. quadriaurita* Retz. ; 6500 ft., erect to 15 in., or up to 4–5 ft., nos. 222 ; 223 ; tropics and subtropics of both hemispheres.

Pteridium.—*P. aquilinum* (Linn.) Kuhn ; 6500–9000 ft., erect to 5 ft., no. 478 ; temperate and tropical regions of both hemispheres.

Polypodium.—*P. excavatum* Bory ; 6500 ft., epiphytic on trees, erect to 11 in., no. 228 ; Tropical Africa, Himalaya, Japan.

Lycopodiales.

Lycopodiaceae.

Lycopodium.—*L. Saururus* Lam. ; 13,000 ft., in marsh, no. 690 ; Tropical and South Africa, Atlantic Is., Mascarene Is., Tropical South America, Kerguellen's Is., Marion Is.

Gymnospermae.

Cupressaceae.

Juniperus.—*J. procera* (Carr.) Hochst. ex A. Rich ; 9000–10,200 ft., a timber tree to 120 ft. (girth 20 ft.), nos. 408 (mature) ; 408a (juvenile) ; East Africa, and probably also in Arabia.

Podocarpaceae.

Podocarpus.—*P. milanjianus* Rendle ; 7500 ft., tree 100 ft., leaves up to 6 in. long, fruit (receptacle) red, no. 694 (♂ & ♀) ; Uganda and Kenya Colony, and southwards to Nyasaland and Gazaland. *P. gracilior* Pilger ; 7000–9000 ft., tree 100 ft. or more, girth 25 ft., leaves up to 2 in. long (usually less), fruit (receptacle obsolete) dark green to black, nos. 64 (♀) ; 64a (♂) ; Jackson 352a (♀) ; Abyssinia and Somaliland, Uganda, Kenya Colony and Tanganyika.

Ranunculaceae.†

Thalictrum.—*T. rhynchocarpum* Dill. et A. Rich. ; 6000 ft., slender herb to 7 ft., flowers cream, growing in shady or swampy places, no. 660 ; Abyssinia southwards to the Transvaal and Natal, and westwards to Ruwenzori and Virunga Mts.

Clematis.—*C. inciso-dentata* A. Rich. ; 6500–7500 ft., climber, flowers creamy, no. 65 ; East Africa, Sudan.

Anemone.—*A. Thompsoni* Oliv., 11,000–12,300 ft., herb 1 ft., flowers white, underside purplish, No. 305 ; Abyssinia, Aberdares, Kilimanjaro, Hanang.

Ranunculus.—*R. pubescens* Thunb. ; 6500–7500 ft., erect herb, 2 ft., flowers yellow, nos. 165 ; 347 ; widely spread in East Africa, southwards to South Africa, and on the Bauchi Plateau. *R. oreophytus* Del. ; 11,600 ft., rosette herb, flowers yellow, no. 363 ; East African Mts., southwards to the Livingstone Mts., Virunga Mts.

Delphinium.—*D. macrocentron* Oliv. ; 6000–12,000 ft. ; erect to 6 ft., flowers greenish-blue, becoming more definitely blue with increasing altitude, no. 26 ; general at high altitudes in Kenya Colony.

Menispermaceae.

Tinospora.—*T. Bakis* (A. Rich.) Miers ; 6500 ft., twiner, flower yellowish-green, no. 593 ; Senegambia eastwards to Abyssinia and Uganda.

Cissampelos.—*C. Pareira* Linn. ; 6500 ft., twiner, flowers green, fruits orange, no. 497 (♀) ; 658 (♂) ; tropics and subtropics of both hemispheres.

Stephania.—*S. cyanantha* Welw. ex. Hiern ; 6500 ft., twiner, flowers dull mauve, fruits scarlet, nos. 502 ; 502a ; Angola. *S. abyssinica* (Dill. et A. Rich.) Walp. ; 8500 ft., twiner, flowers green, no. 493 ; Tropical Africa generally, and South Africa. *S. praelata* Miers ; 6500–7500 ft., creeper, flowers green, no. 447 ; East and South Africa.

Piperaceae.

Peperomia.—*P. reflexa* (Linn.) Dietr. ; 6500 ft., epiphyte, flowers green, no. 520 ; widely distributed in warm regions. *P. rungwensis* Engl., 6800 ft., creeper on rock, spikes white, no. 637 ; Kenya, Livingstone Mts.

Capparidaceae.

Cleome.—*C. monophylla* Linn. ; 6500 ft., erect to 1 ft., flowers pale pink, no. 588 ; Tropical and subtropical Africa generally.

†Of this family, *Ranunculus elgonensis* Ulbr. occurs also at 13,000 ft., and *Clematopsis Oliveri* Hutch. at about 5000 ft.

Gynandropsis.—*G. gynandra* (Linn.) Briq. ; 7200 ft., erect to 1 ft., flowers pink, uncommon, no. 598 ; a tropical weed of cultivation and waste places.

Ritchiea.—*R. Albersii* Gilg ; 6500–7500 ft., shrub 20–30 ft., flowers white and green, pleasantly scented, Jackson no. 321 ("Samisiet") ; Kenya Colony and Uganda.

Cruciferae.

Rorippa.—*R. indica* (Linn.) L. H. Bailey ; 11,700 ft., herb 2 ft., flowers yellow, nos. 393 ; 419 ; East Africa eastwards to India.

Arabis.—*A. alpina* Linn. ; 11,700–13,500 ft., erect, 1 ft. flowers white, no. 361 ; North Temperate and subarctic regions, and the high mountains of East Africa.

Cardamine.—*C. obliqua* Hochst. ex A. Rich. ; 10,850 ft., erect to 1 ft., flowers pale mauve, no. 355 ; Abyssinia, Kenya, Aberdares, Ruwenzori, Virunga Mts. *C. Johnstoni* Oliv. ; 11,500–12,500 ft., in or near wet places, erect herb with rosy purple to white flowers, Tweedie B30 ; Kenya, Kilimanjaro, Virunga Mts.

Arabidopsis.—*A. Thaliana* (Linn.) Schur. ; 11,700 ft., spreading, 4 in., flowers white, no. 362 ; N. Temperate regions, Abyssinia, Kilimanjaro, South Africa.

Violaceae.

Viola.—*V. abyssinica* Steud. ; 7000 ft., spreading, 1 ft., flowers mauve, no. 251 ; East Africa southwards to Nyasaland, S. Rhodesia and the Transvaal, and westwards to Cameroons Mt. and Fernando Po. *V. Eminii* (Engl.) R. E. Fries ; 8600–11,100 ft., spreading, 1 ft., flowers violet, nos. 251a, 375 ; Kenya, Aberdares, Kilimanjaro, Shira, Uluguru, Ruwenzori, Virunga Mts.

Polygalaceae.

Polygala.—*P. ukirensis* Gürke ; 6100 ft., found in one swamp only, erect to 4 ft., flowers yellow, no. 20 ; Ukira, Buddu. *P. Quartiniana* A. Rich. ; 8000–9000 ft., creeper to 8 ft., flowers mauvy pink, nos. 36, 477 ; East Africa. *P. Quartiniana* var. *minor* Chod. ; 6500–8000 ft., spreading, 8–12 in., flowers purple and white, nos. 50 ; 171 ; 357 ; Abyssinia, Kenya Colony. *P. albida* Schinz ; 6500–7500 ft., erect to 3 in., flowers green, no. 12 ; Kilimanjaro southwards to southern Tropical Africa. *P. Volkensii* Gürke ; 6700 ft., erect to 2 ft., flowers greenish-yellow, no. 458 ; Kenya Colony, Uganda and Tanganyika generally, extending to Nyasaland and Rhodesia, and N. Nigeria and Dahomey.

Crassulaceae.

Crassula.—*C. aquatica* (Linn.) Schoenl., 13,600 ft., creeping bog plant, flowers magenta, no. 330 ; Europe, East Africa. *C. Wrightiana* Bullock* ; 6500–7500 ft., in swamps, erect, 3 in. to 1 ft., flowers

white with purple centre, nos. 215 ; 538 ; Kenya, Aberdares, Mau, westwards to Behungi swamp (Virunga Mts.) and Arusha, Tanganyika. *C. erubescens* Bullock* ; 8250 ft., a rock plant, 2 in., with bright scarlet foliage and cream flowers, no. 422.

Kalanchoe.—*K. crenata* Haw. ; 6500–7500 ft., succulent herb to 5 ft., inflorescence and flowers viscid-hairy, flowers deep salmon-coloured, no. 114 ; widely distributed in Tropical Africa. *K. Lugardii* Bullock* ; 6500–7500 ft., erect succulent glabrous herb to 5 ft., flowers pale yellow, no. 115 ; probably also in Tanganyika. *K. Petitiana* A. Rich. ; 9500 ft., and at lower altitudes, succulent herb 4–5 ft., inflorescence and flowers similar to those of *K. crenata*, but glabrous, Tweedie 116 ; Abyssinia and Kenya Colony, westwards to Cameroons Mt.

Umbilicus.—*U. botryoides* Hochst. ex A. Rich. ; 8000–11,800 ft., on rocks, herb 7 in. to 1 ft., flowers greenish-yellow, nos. 86 ; 418 ; Abyssinia, Sudan, Ruwenzori and Cameroons Mt.

Sedum.—*S. ruwenzoriense* E. G. Baker ; 10,200–11,700 ft., on rocks, flowers yellow, no. 423 ; Kenya, Ruwenzori.

Caryophyllaceae†.

Silene.—*S. chirensis* A. Rich. ; 11,700 ft., erect to 15 in., flowers white and pinky-mauve, no. 413 ; Abyssinia, Somaliland, Aberdares, and probably widely distributed in East Africa.

Cerastium.—*C. afromontanum* Th. Fries jr. et H. Weim. ; 11,700–11,800 ft., straggling, sticky herb, flowers white, nos. 324 ; 489 ; Kenya, Aberdares.

Portulacaceae.

Portulaca.—*P. quadrifida* Linn. ; 6600 ft., herb creeping over rocks, flowers yellow, no. 644 ; widely distributed in warm regions.

Polygonaceae.

Oxygonum.—*O. atriplicifolium* (Meisn.) Martelli ; 6900 ft., on rock, erect to 4 in., flowers pink, no. 651 ; East Africa and southern Tropical Africa generally.

Polygonum.—*P. serrulatum* Lag. ; 6300 ft., near water, erect to 30 in., racemes drooping, flowers pink, no. 589 ; East Africa and westwards to Senegambia. *P. acuminatum* H. B. et K.; 6500–7500 ft., erect to 3 ft., flowers pinky-white, no. 164 ; Tropical and South Africa generally, and tropical America.

Rumex.—*R. nepalensis* Spreng. ; 8500 ft., erect to 4 ft., flowers russet, no. 266 ; Tropical Africa generally, and in tropical Asia.

†The moss-like submerged aquatic *Tristicha hypnoides* Spreng., of the family Podostemaceae occurs in streams and rivulets, particularly below waterfalls (*Soundy & Hancock* no. 11a in Herb. Kew.).

R. afromontanus Th. Fries jr. ; 11,700 ft., erect to 7 ft., flowers yellowish green, no. 428 ; Kenya, Ruwenzori, Virunga Mts.†

Phytolaccaceae.

Phytolacca.—*P. dodecandra* L'Hérit. ; 6500 ft., giant creeper climbing to 30 ft., flowers green, fruit orange-red, nos. 512 ; 512a ; Tropical Africa generally, and in tropical America and Asia.

Chenopodiaceae.

Chenopodium.—*C. murale* Linn. ; 6500–7500 ft., spreading, to 1 ft., flowers reddish-green, no. 272 ; East Africa, Sudan, Angola, and S. W. Africa, extending to Socotra, and widely distributed as a weed.

Amarantaceae.

Amaranthus.—*A. tricolor* Linn. ; 6700 ft., spreading, to 2 ft., stems purplish, flowers green, no. 638 (" Wild Spinach ") ; widely distributed as a weed, and also cultivated.

Cyathula.—*C. globulifera* Moq. ; 6500–7500 ft., erect to 10 ft. ; flowers green, no. 137 ; East Africa, Nyasaland, Rhodesia.

Achyranthes.—*A. aspera* Linn., ; 6500–7500 ft., erect to 6 ft., flowers pink, no. 166 ; widely distributed in the warm regions of the Old World.

Linaceae.

Linum.—*L. gallicum* Linn. var. *abyssinicum* (Hochst.) Planch. ; 8000 ft. ; erect to 3 ft., flowers yellow, no. 248 ; East Africa, Virunga Mts.

Geraniaceae.

Monsonia.—*M. biflora* DC. ; 6500–7500 ft., spreading, to 1 ft., flowers white, no. 169 ; East Africa, Rhodesia, Angola and South Africa.

Geranium.—*G. aculeolatum* Oliv. ; 7000–8000 ft., erect to 2 ft., or scrambling to 4 ft., stem armed with prickles, flowers white, nos. 56 ; 243 ; East Africa southwards to Nyasaland. *G. simense* Hochst. ex A. Rich. ; 8000 ft., erect to 3 ft., flowers deep pink, no. 260 ; East Africa southwards to Nyasaland, and westwards to Cameroons Mt. and Fernando Po, extending to Arabia and Madagascar. *G. vagans* Baker ; 10,850 ft., erect to 1 ft., flowers white, no. 356 ; Kilimanjaro, Shira, Nyika Plateau. *G. kilimanscharicum* Engl. ; 11,000–11,800 ft., creeping plant, 2 in., flowers mauve- or magenta-pink, nos. 328 ; 411 ; Aberdares, Kilimanjaro, Shira.

Pelargonium.—*P. multibracteatum* Hochst. ex A. Rich. ; 7000 ft., spreading, 2 ft., flowers pure white, no. 267 ; East Africa southwards to Usambara.

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†A further interesting plant, *Harpagocarpus Snowdenii* Hutch. et Dandy, occurs at 6000–7000 ft.

Oxalidaceae.

Oxalis.—*O. corniculata* Linn. ; 6500–7500 ft., creeping, flowers yellow, no. 254 ; widely distributed in warm regions. *O. corniculata* var. *repens* (Thunb.) Zucc. ; 13,600 ft., creeping, flowers yellow, no. 331 ; widely distributed. *O. purpurata* Jacq. var. *anthelmintica* (A. Rich.) Knuth ; 6500–7500 ft. (and also at lower levels, where the growth is more robust), erect to 7 in., flowers purple, pale mauve, or white, nos. 104 ; 624 ; East Africa. *O. obliquifolia* Steud. ex A. Rich. ; 6900–11,000 ft., erect, 2–6 in., flowers mauve or pink, nos. 476 ; 650 ; East Africa, Nyasaland, Angola, Natal and West Griqualand.

Balsaminaceae.

Impatiens.—*I. papilionacea* Warb. ; 6500–9000 ft., erect, to 5 ft. flowers pink ; nos. 51 ; 194 (partly) ; Kenya, Aberdares, Kilimanjaro, Nyasaland. *I. Hochstetteri* Warb. ; 6500–7500 ft., erect to 5 ft., flowers pink, no. 194 (partly) ; East Africa. *I. elegantissima* Gilg ; 6500–8500 ft., erect to 3 ft., flowers pure white ; no. 265 ; Kenya, Aberdares. *I. phlyctidoceras* Bullock* ; 11,700 ft., erect to 3 ft. ; flowers scarlet-crimson ; no. 313.

Two further species of this genus, both members of Warburg's section *Salpingochilon*, were collected by Mrs. Tweedie in November, 1932, and were received at Kew while this paper was in the press. I have not yet been able to identify them. The notes accompanying them are as follows :—No. A2, " Balsam of great beauty, found in sheltered and shaded places under cliffs and boulders kept wet by drips from the rocks as well as by rain, and still moist when the bogs have dried, at 12,500 ft. and higher." No. A7, " Fine scarlet balsam found in shady spots about the edge of woods at 10,500–11,500 ft., showing a tendency to climb where it finds support." These very probably represent undescribed species, and further herbarium material is very desirable.

Lythraceae.

Ammannia.—*A. aegyptiaca* Willd. ; 6400 ft., near water, spreading, 2 ft. ; no. 536 ; Mediterranean region, Orient, India, and Tropical Africa.

Lythrum.—*L. rotundifolium* Hochst. ex A. Rich ; 9000–9500 ft., in bogs, spreading, to 1 ft., flowers bright purple or magenta, nos. 321a ; 321b ; East Africa.

Oliniaceae.

Olinia.—*O. usambarensis* Gilg ; 6500–7500 ft., shrub or tree 40–50 ft., flowers white, nos. 202 ; Jackson 337a ; Kenya, Aberdares, Livingstone Mts.

Punicaceae.

Punica.—*P. Granatum* Linn. ; 6050 ft., some distance from cultivation, and not now known to be cultivated in the vicinity, shrub to 12 ft., flowers scarlet, no. 300 ; native in Persia to N. W. India and widely cultivated as the well-known Pomegranate.

Onagraceae.

Ludwigia.—*L. prostrata* Roxb. ; 6400 ft., erect herb growing near water, with yellow flowers, no. 535 ; East and South Tropical Africa, extending to the Mascarene Is., India and eastern Asia.

Epilobium.—*E. hirsutum* Linn. ; 6500 ft., near water, erect to 6 ft., flowers crimson, no. 499 ; widely distributed in the Old World. *E. cordifolium* A. Rich. ; 9000 ft., near water, suberect, flowers pale pink, no. 348a ; East Africa.

Thymelaeaceae.

Lasiosiphon.—*L. glaucus* Fresen. ; 8500 ft., tree to 20 ft., flowers yellow, in heads, no. 382 ; Abyssinia, Kenya, Aberdares, Kilimanjaro, Nyasaland, Cameroons Mt. *L. lampranthus* Gilg ; 6800 ft., shrub 4–10 ft., flowers yellow-orange, in heads, no. 516 ; Tanganyika (Karagwe) and Uganda (W. Toro, W. Ankole).

Proteaceae.

Protea.—*P.* sp. indet. ; 11,800 ft., shrub to 20 ft., flowers cream, no. 402 ; material insufficient.

Pittosporaceae.

Pittosporum.—*P. abyssinicum* Del. ; 6800 ft., shrub 12 ft., seeds scarlet, no. 627 ; East Africa.

Flacourtiaceae.

Doryalis.—*D. macrocalyx* (Oliv.) Warb. ; 6600 ft., shrub to 8 ft., fruits scarlet, no. 577 ; 648 ; Kenya Colony, Uganda, and Portuguese East Africa westwards to Angola.

Flacourtia.—*F. Kirkiana* Burtt Davy ; 6500–7500 ft., spreading tree to 35 ft. ; flowers yellowish-green ; nos. 544 ; 587 ; Jackson 348 ; Livingstone Mts., Rhodesia.

Cucurbitaceae.

Trochomeria.—*T. Harmsiana* Bullock* ; 6500–7500 ft., creeper, leaves digitately divided into linear segments, flowers green, fruit scarlet, globose, no. 143.

Momordica.—*M. foetida* Schum. et Thonn. ; 6500–7500 ft., twining creeper, leaves ovate, deeply cordate at the base, flowers pale yellow or greenish-white, fruit oval, orange coloured, prickly, nos. 98 ; 448 ; widely spread in Tropical Africa, extending to Natal.

Coccinia.—*C. adoensis* (Hochst. ex A. Rich.) Cogn. ; 6700 ft., twiner, leaves digitately divided into linear toothed segments, pale salmon flowers, fruits orange, no. 542 ; Abyssinia.

Myrtaceae.

Syzygium.—*S. cordatum* Hochst. ex Sond. ; 6500–7500 ft., tree 30–50 ft., flowers white, fruits globose, purple, 1 in. diam., nos. 181 ;

Jackson 345a ; Kenya and Uganda southwards to Portuguese East Africa and westwards through Nyasaland, Rhodesia and Katanga to Angola.

Melastomaceae.

Dissotis.—*D. macrocarpa* Gilg ; 6500–7000 ft., erect to 3 ft., flowers purple-magenta, no. 230 ; swamps of western Kenya Colony, Uganda and Bukoba. *D. alpestris* Taub. ; 6500–7500 ft., erect, 4 ft., flowers mauve, no. 72 ; Kenya Colony, Uganda, Virunga Mts., Tanganyika and Nyasaland.

Combretaceae.

Combretum.—*C. elgonense* Exell* ; 6100 ft., spreading tree to 20 ft., flowers green, no. 524. *C. Guenzii* Sond. ; 6200 ft., tree to 20 ft., fruit green, winged, no. 286 ; Kenya Colony and Uganda southwards to Natal and westwards through Nyasaland, Rhodesia, and Katanga to Angola and South-west Africa.

Hypericaceae.

Hypericum.—*H. kiboense* Oliv. ; 11,500 ft., flat, spreading habit, to 5 ft., flowers yellow, with red sepals, capsules red, no. 323 ; Kenya, Aberdares, Kilimanjaro. *H. lanceolatum* Lam. ; 8600 ft., tree to 20 ft., flowers golden, no. 472 ; widely distributed on the African mountains, and in Madagascar. *H. Quartinianum* A. Rich. ; 7000 ft., shrub to 8 ft., flowers yellow, no. 59 ; East African highlands southward to Nyasaland. *H. peplidifolium* A. Rich. ; 6500–7500 ft., ground creeper, flowers yellow, no. 205 ; Abyssinia and eastern Sudan, westwards to Cameroons Mt. and southwards to Nyasaland and Rhodesia. *H. afromontanum* Bullock* ; 11,800 ft., perennial herb, stems simple, erect to 18 in., flowers in heads, yellow, striped red, glands black, stalked ; no. 338a.

Tiliaceae.

Grewia.—*G. similis* K. Schum. ; 6500–7500 ft., shrub to 15 ft., flowers mauve, nos. 253 ; 677 ; East Africa generally, and in Rhodesia and Katanga.

Triumfetta.—*T. macrophylla* K. Schum. var. *ruwenzoriensis* Sprague et Hutch. ; 8000 ft., erect to 6 ft., flowers orange-yellow, no. 45 ; the typical form, and its varieties, occurs throughout Uganda, Kenya Colony and Tanganyika.

Sparmannia.—*S. ricinocarpa* (Eckl. et Zeyh.) O. Kuntze ; 9500–11,500 ft., a bushy plant of the forest undergrowth, flowers pink, fruits armed with hooked spines, Tweedie A11 ; widely distributed in eastern Tropical Africa, and in South Africa.

Sterculiaceae.

Dombeya.—*D. Dawei* Sprague ; 6500–7500 ft., shrub to 20 ft., flowers white, nearly 2 in. in diameter, no. 127 ; Victoria Nyanza

basin, Kilimanjaro, Virunga Mts. *D. rotundifolia* Harv.; 6500–7500 ft., tree 20–30 ft., flowers pinkish-white, less than 1 in. diameter, corolla persistent, nos. 249; Jackson 335a ("Porowet-at-Ko"); Kenya Colony and Tanganyika southwards to the Cape.

Malvaceae.

Malva.—*M. verticillata* Linn.; 11,800 ft., erect to 2 ft., flowers mauve, no. 487; Abyssinia and Egypt eastwards to India, and now widely spread owing to transportation with seeds, etc.

Sida.—*S. Schimperiana* Hochst. ex A. Rich.; 6600 ft., woody, spreading undershrub to 8 in., leaves small, obcordate, flowers yellow, no. 614; East Africa southwards to Usambara, extending to India. *S. rhombifolia* Linn.; 6500–7500 ft., erect shrub to 5 ft., leaves ovate, acuminate, flowers buff, no. 123; widely spread in the tropics.

Abutilon.—*A. longicuspe* Hochst. ex A. Rich.; 6500–7500 ft., erect to 6 ft., flowers pale purple, no. 162; East Africa. *A. Mauritianum* (G. Don) Sweet; 6500–7500 ft., erect to 8ft., flowers golden, no. 138; widely spread in tropical and subtropical Africa.

Pavonia.—*P. Schimperiana* Hochst. ex A. Rich.; 6500–7500 ft., erect to 7 ft., flowers white, no. 192; East Africa, Mascarene Islands, extending to the Belgian Congo, Cameroons and West Africa. *P. urens* Cav.; 6500–7500 ft., erect, 6–10 ft., flowers pink or purplish-pink, nos. 5; 193; Kenya Colony and Uganda southwards to Nyasaland.

Kosteletzkya.—*K. adoensis* Hochst. ex Walp. var. *hirsuta* Oliv.; 6500–7500 ft., erect to 2 ft., flowers pale purple or cream flushed with purple, and with a purple centre, nos. 161; 178; East Africa westwards to the Cameroons Mt.

Hibiscus.—*H. vitifolius* Linn.; 6700 ft., spreading, to 6 ft., flowers large, primrose-yellow with maroon centre, no. 454; widely spread in the Old World tropics, and in Australia. *H. diversifolius* Jacq.; 6500–7500 ft., shrub to 5 ft., stems prickly, flowers large, lemon-yellow, with deep purple throat and purple flush on the lower surface, nos. 60; 449; Tropical and South Africa, Mascarene Islands and Australia. *H. cannabinus* Linn.; 6500–7500 ft., erect to 6 ft., stems, petioles and calyx prickly, leaves palmately lobed to the base, flowers large, cream with crimson throat, no. 188; widely spread by cultivation in the Old World and subtropical Australia. *H. calyphyllus* Cav.; 6500–7500 ft., erect to 15 ft., not prickly, flowers very large (3 in. long), pale yellow, no. 152; East Africa southwards to South Africa. *H. gossypinus* Thunb.; 6500–7500 ft., erect to 10 ft. stems, calyx, etc., clothed with dark brown stellate hairs, flowers about 1 in. long, pure white, seeds cottony, no. 122; East Africa southwards to Natal and South Africa. *H. aethiopicus*

Linn. ; 6100 ft., erect, 3–5 in. flowers about 1 in. long, lemon-yellow, no. 527 ; widely spread in East Africa and extending to South Africa. *H. aponeurus* Sprague et Hutch. ; 6500–7500 ft., erect to 3 ft., flowers less than 1 in. long, scarlet, no. 236 ; East Africa and the Sudan.

Euphorbiaceae.

Euphorbia.—*E. Euryops* Bullock* ; 10,000 ft., stems simple, erect to 2 ft., bracts deep crimson ; no. 380. *E. Wellbyi* N.E.Br. ; 11,000 ft., stems simple, clustered, erect to 1 ft. ; no. 395 ; also in Abyssinia.† *E. Schimperiana* Scheele ; 6500–7500 ft., herb, erect to 5 ft., flowers green, no. 273 ; Arabia and Abyssinia southwards to Nyasaland and westwards to the Virunga Mts.

Bridelia.—*B. micrantha* Baill. ; 6500–7500 ft., spreading tree to 40 ft., flowers green, in axillary clusters, fruits red, nos. 277 ; Jackson 346a ; widely distributed in Tropical and South Africa.

Phyllanthus.—*P. Fischeri* Pax ; 8000–10,000 ft., in forest, Tweedie 43 ; Kenya Colony, Usambara.

Croton.—*C. macrostachys* Hochst. ex A. Rich. ; 6700 ft., spreading tree to 30 ft., flowers in racemes, green, practically evergreen, leaves turn orange before falling, no. 642 ; East Africa generally, and in Nyasaland and Portuguese East Africa, extending westwards through the Belgian Congo to French Guinea.

Cluytia.—*C. abyssinica* Jaub. et Spach. ; 6500–7500 ft., shrub to 6 ft., flowers greenish white in axillary clusters, no. 124 ; eastern Tropical Africa generally. *C. robusta* Pax ; 11,800 ft., shrub 4 ft. flowers green, stems tomentose when young, no. 464 ; Abyssinia, Aberdares, Mau Plateau, Kilimanjaro, and southwards to Gazaland.

Acalypha.—*A. Volkensii* Pax ; 6400 ft., spreading to 4 ft., male flowers brick red, in spikes up to 3 in. long, females near the base of the male spike ; no. 531 ; East Africa.

Ricinus.—*R. communis* Linn. (Castor Oil Plant) ; 6500–7500 ft., near cultivated or formerly cultivated land, erect to 15 ft., male flowers pale yellow, female red, no. 281 ; throughout Tropical Africa, and widely cultivated in warm and temperate regions.

Rosaceae.

Pygeum.—*P. africanum* Hook. f. ; 6500–7500 ft., tree 20–60 ft., flowers yellowish green, fruits dark red, nos. 445 ; Jackson 349a (" Aramaatet ") ; widely distributed in eastern Tropical Africa from Kenya and Uganda southwards to Natal, extending westwards to the Cameroons Mt., Gabon and Angola.

†The Mt. Elgon material differs somewhat from the Abyssinian plant, in its more obtuse leaves and completely glabrous stems, but I have been unable to establish specific distinction.

Rubus.—*R. Steudneri* Schweinf. ; 8500 ft., spreading, to 6 ft., flowers pink, fruit orange, no. 263 ; Abyssinia, Imatong Mts., Nandi Plateau, Ruwenzori. *R. Volkensii* Engl. ; 8500 ft., near water, erect to 6 ft., flowers creamy white, plant very sticky, no. 304a ; Abyssinia, Kenya, Aberdares, Mau, Kilimanjaro. *R. pinnatus* Willd. ; 6500 ft., creeper to 20 ft., petals absent or very short, fruit orange, no. 509 ; Tropical and South Africa, extending to the Atlantic Is.

Alchemilla.—*A. argyrophylla* Oliv.; 11,500–13,500 ft., shrub to 4 ft., foliage silvery, flowers cream, no. 369 ; Kenya, Aberdares, Kilimanjaro, Shira Mts., and probably also Ruwenzori. *A. Granvikii* Th. Fries, jr. ; 12,800 ft., glabrous, climbing to 3 ft., stems red, flowers green, no. 332a ; Kinangop. *A. Johnstoni* Oliv. ; 13,000 ft., pilose subshrub, Tweedie 82 ; Kilimanjaro, Virunga Mts.

Hagenia.—*H. abyssinica* Willd. ; up to 12,000 ft., a tree to 30 ft., flowers rose pink, in large panicles, no. 430 ; Abyssinia, Kenya, Aberdares (?), Ruwenzori, Virunga Mts., Kilimanjaro, Meru, Livingstone Mts., Nyasaland.

Caesalpiniaceae.

Caesalpinia.—*C. sepiaria* Roxb. ; 6500 ft., spreading shrub to 10 ft., with recurved prickles on stem and leaf rachis, flowers racemose, yellow, filaments bearded, no. 298 ; a semi-naturalised introduction from Tropical Asia.

Pterolobium.—*P. exosum* (Gmel.) E. G. Baker ; 6500–7500 ft., climber to 30 ft., with recurved prickles, flowers dull white, fruits winged, scarlet or brick red, no. 237 ; Abyssinia and southwards to the Transvaal.

Cassia.—*C. didymobotrya* Fresen. ; 6500–7500 ft., shrub 10–15 ft., flowers yellow, pods green to brown, about 4 in. long and $\frac{3}{4}$ in. broad, nos. 154 ; Jackson 304 ; East Africa westwards through Rhodesia to Angola. *C. mimosoides* Linn. ; 6500–7500 ft., erect, 3–4 ft., flowers yellow, pods about 3 in. long, less than $\frac{1}{4}$ in. broad, nos. 23 ; 219 ; Tropical Africa generally, and in Asia and Australia. *C. usambarensis* Taub. ; 6500–7500 ft., trailing on ground, petals yellow, sepals terra-cotta, pods about 1 in. long, no. 255a ; Aberdares, Usambara Mts. *C. bicapsularis* Linn. ; 6500–7500 ft., spreading bush to 4 ft., flowers orange-yellow, no. 450 ; a naturalised introduction from Tropical South America and the West Indies, and cultivated all over Africa and Tropical Asia.

Mimosaceae.

Entada.—*E. abyssinica* Steud. ; 6500–7500 ft., in fairly open country, spreading tree 20–30 ft., flowers spicate, yellow, pods green to brown, nos. 600 ; Jackson 341 ; Tropical Africa generally.

Acacia.—*A. Lahai* Steud. et Hochst. ex Benth.; 6500–7500 ft., flat-topped tree to 25 ft., spines straight, in pairs, flowers cream, spicate, nos. 513; Jackson 347a ("Karmetiet"); Abyssinia, Eritrea. *A. abyssinica* Hochst. ex Benth.; 6500–7500 ft., flat-topped, spreading tree to 30–50 ft., flowers capitate, cream or pinkish-white, nos. 582; Jackson 333a ("Marambayet"); Abyssinia, Eritrea, Sudan. *A. stenocarpa* Hochst.; 6500–7500 ft., tree to 20 ft., flowers capitate, yellow, pods narrow, brown, nos. 75; Jackson 332 ("Ndiniet"); East Africa generally.

Albizzia.—*A. gummifera* (Gmel.) C. A. Smith; 6500–7500 ft., forest tree 35–60 ft., with tall straight bole and large spreading crown, flower-heads paniculate, flowers white, filaments united in a tube, red, pods brown, nos. 511; Jackson 336 (Seswet); Tropical Africa generally, and South Africa.

Papilionaceae.

Crotalaria.—*C. glauca* Willd.; 6500–7500 ft., glabrous, erect herb, 12–18 in., leaves unifoliolate, somewhat glaucous, flowers yellow, in lax racemes, pods about 1 in. long, nos. 198; 459; widely distributed in Tropical and South Africa. *C. Lugardiorum* Bullock*; 6500–7500 ft., spreading herb 12–18 in., stems, lower surface of the unifoliolate leaves, inflorescence, calyx, and pods clothed with short black-based stout hairs, flowers in lax racemes, yellow above, russet below, nos. 197; 530. *C. cephalotes* Steud.; 6500–7500 ft., pubescent, spreading, 6–12 in., flowers in heads, orange yellow, pods subglobose, hairy; no. 170; Tropical Africa generally, and the Transvaal. *C. agatiflora* Schweinf.; 6500–7500 ft., uncommon, shrub to 6 ft., flowers large, yellow, no. 153; East Africa generally, southwards to northern Tanganyika. *C. keniensis* E. G. Baker; 8500–9000 ft., shrub, semiscandent, 4–6 ft., flowers yellow, nos. 320; 481; Kenya, Aberdares, Meru. *C. cleomifolia* Welw. ex Baker; 6500–7500 ft., erect, 6–7 ft., flowers yellow, in hairy racemes often over 1 ft. long, nos. 2; 187; widely distributed in Tropical Africa. *C. recta* Steud.; 7000 ft., erect to 4 ft., flowers yellow, racemes stout, up to 1 ft. long, no. 440; East Africa southwards to Nyasaland, and in the Belgian Congo. *C. Plowdeni* Baker; 6500–7500 ft., spreading to 2 ft., flowers yellow, no. 207; Abyssinia and Taita Hills. *C. intermedia* Kotschy; 6500–7500 ft., shrub 5–8 ft., flowers yellow or russet, nos. 24; 216; widely distributed in Tropical Africa.

Argyrolobium.—*A. leucophyllum* Baker; 6500–7500 ft., erect to 3 ft., flowers yellow, no. 33; Kenya Colony westwards to Ruwenzori and southwards to Nyasaland.

Adenocarpus.—*A. Mannii* Hook. f.; 11,700 ft., shrub to 4 ft., flowers yellow, no. 359; widely distributed in Tropical Africa.

Trifolium.—*T. multinerve* A. Rich.; 11,500 ft., ground creeper, flowers purple, 2–5 in each head, no. 397; Abyssinia, Eritrea, Kenya. *T. acaule* Steud.; 13,000 ft., small ground creeper, flowers mauve, 1–3 in each head, no. 329; Abyssinia, Eritrea, Kenya. *T. simense* Fresen.; 8500 ft., erect to 18 in, leaflets linear lanceolate, flowers magenta, numerous, subspicate, no. 344; East Africa generally, extending to Cameroons Mt. and Fernando Po. *T. Lugardii* Bullock*; 6500–7500 ft., erect to 2 ft., flowers purple, numerous, no. 97. *T. cryptopodium* Steud.; 12,800 ft., ground creeper, leaves very small, flowers bluish purple, numerous, no. 333; Abyssinia, Aberdares, Kilimanjaro. *T. semipilosum* Fresen.; 10,000 ft., ground creeper, flowers white, numerous, no. 351; mountains of Abyssinia and Kenya Colony, and on Kilimanjaro. *T. subrotundum* Hochst. et Steud.; 11,800 ft., suberect, flowers purple, numerous, leaflets obovate, no. 485; East Africa southwards to Nyasaland and Angola, and westwards to Cameroons Mt. and Fernando Po. *T. Steudneri* Schweinf.; 8000 ft., erect to 6 in., leaflets linear-oblong, flowers purple, numerous, no. 38; Abyssinia, Eritrea.

Lotus.—*L. Oehleri* Harms; 8650 ft., pubescent shrub to 2 ft., flowers cream and purple, no. 495; Aberdares. *L. Brandianus* Harms; collected with the preceding, glabrous or nearly so; no. 495a; also in Tanganyika.

Indigofera.—*I. subargentea* De Wild.; 6500–7500 ft., spreading, to 8 in., flowers salmon pink, nos. 167; 208; north-eastern Congo and Ankole.

Tephrosia.—*T. linearis* Pers.; 6500–7500 ft., slender erect herb 2–3 ft., flowers yellow, in lax narrow panicles, no. 70; widely spread in East and West Africa. *T. interrupta* Hochst. et Steud.; 6400 ft., erect to 10 ft., flowers bright purple, in interrupted narrow panicles about 12 in. long, no. 539; Abyssinia, and probably widely spread in Kenya Colony. *T. atro-violacea* E. G. Baker; 8000 ft., erect to 8 ft., flowers purple, calyx clothed with dark brown or black hairs, no. 43; Kenya Colony, Belgian Congo and northern Tanganyika.

Craibia.—*C. Brownii* Dunn; 6500 ft., a tree about 20–30 ft., flowers cream, tinged pale pink, or mauve, nos. 659; s.n.; ["Clepte-wewet"—Mr. H. B. Dooner]; Kenya Colony, Uganda (Mabira Forest) and Tanganyika (Singida Distr.).

Sesbania.—*S. aegyptiaca* Poir.; 6500–7500 ft., tree to 20 ft., flowers yellow, standard purple-mottled, no. 196; widely spread in Tropical Africa and extending to Transvaal and Natal, and common in most tropical countries.

Colutea.—*C. istria* Mill.; 8000 ft., erect shrub to 6 ft., flowers deep maroon, pods brown, bladder-like, no. 271; East Africa, Arabia, Persia and Asia Minor.

Astragalus.—*A. somalensis* Taub. var. *Lindblomii* Harms ; 6500–7500 ft., erect to 4 ft., flowers purple ; No. 14. *A. elgonensis* Bullock* ; 12,800 ft., creeping, flowers mauve-pink, no. 334 ; infected with the rust fungus *Uromyces Astragali* (Opiz) Sacc. (det. Miss E. M. Wakefield).

Aeschynomene.—*A. Schimperi* Hochst. ex Baker ; 6500–7500 ft., erect to 3 ft., flowers orange, pods articulate, with stiff scattered hairs and prickles, no. 15 ; East Africa, extending to Rhodesia.

Zornia.—*Z. tetraphylla* Michx. ; 6500–7500 ft., ground creeper, flowers brick red to salmon pink, leaves 4-foliolate, nos. 159 ; 176 ; Kenya Colony and Uganda southwards to Rhodesia, Angola and South Africa.

Desmodium.—*D. Scalpe* DC. ; 6500–9000 ft., climber with orange or terra-cotta flowers, pods articulate, nos. 39 ; 220 ; widely distributed.

Vicia.—*V.* sp. ; 8800 ft., a hairy tendril climber, flowers violet-blue, in 3–4-flowered racemes, no. 343a ; material insufficient for determination.

Lathyrus.—*L. hygrophilus* Taub. ; 6500–7500 ft., tendril climber, leaves bifoliolate, flowers solitary, yellow, no. 16 ; Aberdares, Kilimanjaro, Virunga Mts. and Nyasaland.

Glycine.—*G. javanica* Linn. ; 6500–7500 ft., twiner to 16 ft., flowers white with mauve throat, in raceme-like panicles about 6 in. long, pods densely brown-hairy, nos. 129 ; 244 ; 451 ; widely distributed.

Erythrina.—*E. tomentosa* R. Br. ; 6500–7500 ft., tree to 15 ft., bole with thick corky bark, recurved prickles on smaller branches and leaf-rhachis, flowers scarlet, seeds scarlet and black, no. 117 ; East Africa southwards to Southern Rhodesia.

Vigna.—*V. gracilis* (Guill. et Perr.) Hook. f. ; 6500–7500 ft., twiner, flowers blue, no. 180 ; Kenya, Taita Hills, and the eastern half of Tanganyika. *V. Schimperi* Baker ; 7000 ft., twiner with yellow flowers, no. 246 ; Abyssinia, Kenya, Kabete grasslands. *V. fragrans* E. G. Baker ; 6100 ft., about 2 in. (to 1 ft.) high, flowers mauve, peduncle arising from the rootstock before the leafy shoots, no. 528 ; Ankole (Uganda) and probably also on the Nandi Plateau, and in Northern Tanganyika. *V. vexillata* Benth. ; 6500–7500 ft., twiner, flowers large, purple, pods linear, brown-hairy, no. 62 ; widely distributed. *V. pygmaea* R. E. Fries (?) ; 6000–6700 ft., dwarf, erect to 4 in., flowers green to mauve, nos. 528a ; 575 ; Rhodesia, Nyasaland.

Dolichos.—*D. formosus* A. Rich. ; 6500–7500 ft., twiner, flowers purple or pink, nos. 18 ; 89 ; 460 ; Abyssinia, Eritrea. *D. biflorus*

Linn. ; 6500 ft., twiner, flowers green, in pairs, no. 501 ; widely distributed. *D. Lablab* Linn. ; 6500–7500 ft., climber, flowers purple-pink, in long racemes, no. 133 ; widely distributed.

Rhynchosia.—*R. usambarensis* Taub. ; 6500–7500 ft., creeping, foliage variegated, flowers yellow and maroon, in lax axillary racemes, no. 163 ; Aberdares and surrounding plateaux, Kilimanjaro, Usambara.

Eriosema.—*E. cordifolium* Hochst. (?) ; 6700 ft., trailing on ground, leaves unifoliolate, flowers yellow and chocolate, in racemes, no. 649 ; Abyssinia, N. Nigeria. *E. sparsiflorum* E. G. Baker ; 6100 ft., erect to 1 ft., leaves trifoliolate, flowers yellow and russet, in lax axillary racemes, no. 567 ; Djurland and the Sudan westwards to N. Nigeria.

Flemingia.—*F. rhodocarpa* Baker ; 6500 ft., shrub to 5 ft. flowers greenish white, pods short, orange-red, due to a dense coating of glands, no. 67 ; Kenya Colony and Uganda southward to Rhodesia.

Hamamelidaceae.

Trichocladus.—*T. malosanus* Baker ; 6500–7500 ft., shrub or tree 20–30 ft., flowers yellow, nos. 289 ; Jackson 311 ; Kenya Colony and Uganda, and in N. W. Rhodesia.

Moraceae.

Dorstenia.—*D. tropaeolifolia* (Scwheinf.) Bureau ; 7300 ft., erect to 4 in., leaves adpressed to ground, flowers creamy pink, no. 617 ; Gallabat, Unyoro, Serere, and in Kenya Colony south-east of Mt. Elgon ; also (Milbraed 9433) a very large form at Buar, Cameroons.

Urticaceae.

Urtica.—*U. massaica* Mildbr. ; stinging herb, erect to 4 ft., flowers green, no. 200 ; Kenya, Aberdares, Ruwenzori, Virunga Mts., Masai highlands and Meru.

Laportea.—*L. alatipes* Hook. f. ; 11,500 ft., a stinging herb of the forest undergrowth, flowers green in axillary and terminal panicles, Tweedie A9 ; Kenya, Aberdares, Kilimanjaro, Meru, Ruwenzori and Cameroons Mt., and probably also in Rhodesia.

Celastraceae.

Elaeodendron.—*E. Buchanani* Loes. ; 6500–7500 ft., tree 30–40 ft., flowers whitish or pale green ; Jackson 318a ; 328a (" Sainet ") ; Buddu, Nyasaland, Portuguese East Africa, Gazaland and Angola. *E. sp.* indet. ; 6500–7500 ft., shrub or tree 15–20 ft., flowers white, fruit pale green (neither collected), Jackson 307 (" Chepkatet ") ; specimens of this species from Kenya and Aberdares are preserved at Kew.

Gymnosporia.—*G. lancifolia* Loes. ; 6500–7500 ft., tree to 40 ft., fruit pale green to yellow, nos. 547 ; s.n. ; Jackson 327 ; 342a (" Chemoia," " Kwongwet ") ; widely distributed in East Africa southwards to the Livingstone Mts. *G. maranguensis* Loes. ; 6500–7000 ft., erect shrub with straight spines, seeds orange brown, in light brown capsule, no. 278 ; Kenya, Kilimanjaro. *G. Atkaio* (A. Rich.) Loes. ; 6500–7500 ft., shrub or small tree 15–20 ft., flowers small, white in axillary puberulous cymes, nos. 678 ; Jackson 306a (" Kwangwet ") ; Abyssinia, Kenya.

The following specimens belong to this genus, but have not been satisfactorily determined : nos. 653 ; 692 ; s.n.

Loranthaceae.

Loranthus.—*L. curviflorus* Benth. ; 6500–7500 ft., parasite on *Acacia* sp., flowers yellow-red, no. 157 ; East Africa as far south as the Livingstone Mts., and in Arabia. *L. usuiensis* Oliv. ; 6500–7500 ft., a parasite, flowers deep red, nos. 172 ; Jackson 317a ; forest areas of Kenya Colony, Uganda, and Tanganyika. *L. woodfordioides* Schweinf. ; 6500–8500 ft., parasite, flowers scarlet and grey, berries pink, Nos. 80 ; 552 ; 552a ; Jackson 314a ; Somaliland, high altitudes in Kenya Colony, Virunga Mts.

Viscum.—*V. nervosum* Hochst. ; 6500–7500 ft., parasite, flowers yellow, berries white, *Jackson* 315a ; widely distributed in East Africa, extending southwards to Natal and westwards to S. Nigeria and St. Thomas Is.

Loranthaceous parasites are known to the Ul Kony by the general name " Mondowet " (*teste* Jackson).

Santalaceae.

Osyris.—*O. abyssinica* Hochst. ex A. Rich. ; 8100 ft., spreading shrub to 12 ft., flowers yellow, fruit scarlet, no. 517 ; East Africa generally, extending westward through Nyasaland and Rhodesia to Angola and S. W. Africa ; also in South Africa and Arabia.

Rhamnaceae.

Rhamnus.—*R. prinoides* L'Hérit. ; 6500–7500 ft., shrub to 10 ft., with very shiny foliage, flowers green-maroon, nos. 576 ; Jackson 334a ; widely distributed in eastern Africa from Abyssinia to the Cape, extending westwards to Ruwenzori, Virunga Mts., and Cameroons Mt.

Scutia.—*S. myrtina* (Burm.) Kurz ; 6500–7500 ft., climbing shrub 20–30 ft., armed with recurved prickles, flowers and fruits green, nos. 292 ; 621 ; Jackson 323a ; widely distributed in eastern Africa, extending to the Mascarene Is. and India.

Helinus.—*H. mystacinus* (Ait.) E. Mey. ; 6500–7500 ft., climber to 50 ft., flowers white or green ; nos. 128 ; Jackson 308 ; East Africa, Virunga Mts., Gazaland, Southern Rhodesia.

Ampelidaceae.

Rhoicissus.—*R. erythrodes* (Fresen.) Planch.; 6500–7500 ft., creeper over trees, to 30 ft., flowers green, no. 283; widely distributed in East and South Africa, extending westwards to N. Nigeria in the north, and to Angola in the south; also in Arabia.

Cissus.—*C. Kaje* Gilg; 6700 ft., tendril climber or creeper, stems and petioles clothed with crimson glandular hairs, flowers green, no. 643; also on the Livingstone Mts. *C. nodiglandulosa* Th. Fries jr.; without notes; a tendril climber like the last, but stems glandular only near the nodes, and leaves densely tomentose below, s.n.; also on Kenya. *C. cyphopetala* Fresen.; 6500–7500 ft., tendril climber to 20 ft., stems not glandular, leaves tomentose below, flowers pale green, fruit green, hairy, Jackson 343 ("Nablabalait"); Abyssinia, Eldoma, Mau, and Cameroons (Kongola, Mbussa). *C. jatrophoides* (Welw. ex Baker) Planch.; 6600 ft., glabrous, erect to 30 in., leaves sessile, flowers green, fruit orange, no. 500; Tanganyika southwards and westwards to Rhodesia and Angola, and in the Cameroons (Buar).

Rutaceae.

Toddalia.—*T. asiatica* Lam., 6500–7500 ft., spiny scrambling shrub 20–30 ft., flowers whitish green, fruits orange, seeds strongly aromatic, nos. 537; 679; Jackson 302a; widely distributed in warm regions of the Old World.

Teclea.—*T. nobilis* Del.; 6500–7500 ft., tree 20–30 ft., fruit red; Jackson 330a ("Quiriondet"); East Africa and the Sudan southwards to Nyasaland and Rhodesia. The seed is ground, boiled, and given to cattle as a laxative.

Meliaceae.

Ekebergia.—*E. Rueppeliana* Fresen. ex A. Rich.; 6500–7500 ft., tree up to 150–200 ft. high with an enormous spread, the largest tree in the Elgon forests excepting *Podocarpus*, flowers white or pink, fruit brown, Jackson 309a; 350; 351a ("Nenwet"; "Kabrimetet"); Abyssinia, Eritrea, Sudan, Kenya, Kilimanjaro and Meru.

Trichilia.—*T. Volkensii* Gürke; 6500–7500 ft., tall tree, 40–50 ft., flowers pale green, Jackson 339a ("Pionyet"); Kenya Colony southwards to Nyasaland.

Turraea.—*T. Holstii* Gürke; 6800 ft., shady places in forest country, shrub 15–20 ft., flowers pendulous, white with a strong jasmine scent, capsule green, seeds red, nos. 623; Jackson 301a ("Timbiriandet"); Tanganyika.

Sapindaceae.

Allophylus.—*A. macrobotrys* Gilg; 6500–7500 ft., shrub 15–20 ft., flowers white, fruits green, nos. 671; Jackson 316a; Uganda,

N. W. Tanganyika. *A. subcoriaceus* E. G. Baker ; 6500–7500 ft., shrub, fruits green, Jackson 320a ; Uganda, Kenya Colony. *A. abyssinicus* (Hochst.) Radlk. ; 8000 ft., shrub 6 ft., flowers dirty white, no. 256 ; East Africa.

A further specimen of this genus, no. 508, was too badly galled for accurate determination.

Deinbollia.—*D. kilimandscharica* Taub. ; without notes, s.n. ; S. Kenya Colony (including Nyanza Basin), Kilimanjaro.

Melianthaceae.

Bersama.—*B. Engleriana* Gürke ; 6500–7500 ft., spreading tree 25–50 ft., flowers white, pink in bud, nos. 239 ; Jackson 325 ; Kenya Colony, Uganda.

Anacardiaceae.

Rhus.—*R. glaucescens* A. Rich. (*sens. ampl.*) ; 6500–7500 ft., somewhat glaucous shrub or tree to 20 ft., flowers whitish green, small, in axillary panicles, fruit green, nos. 136 ; Jackson 313a (" Siruet ") ; East Africa and S. E. Tropical Africa, and westwards to N. Nigeria. *R. incana* Mill. (*sens. ampl.*) ; 6500–7500 ft., shrub 20–30 ft., leaves and young stems densely villous, flowers pale green, fruit edible, maroon, Jackson 326a (" Siruet ") ; widely distributed in Tropical and South Africa. *R. inamoena* Standley ; 6500–7500 ft., glabrous tree 30–40 ft., flowers white, in axillary and terminal panicles, fruits green, foliage pale green, Jackson 312a (" Ingororowet ") ; Kenya Colony, Zanzibar and southwards to Lake Nyasa.

Heeria.—*H. reticulata* (E. G. Baker) Engl. ; 7000 ft., spreading tree to 15 ft., leaves simple, strongly reticulate below, flowers small, green, in terminal panicles, no. 288 ; Kenya Colony and Uganda southward to Nyasaland and Gazaland.

Araliaceae.

Cussonia.—*C. spicata* Thunb. ; 6500 ft., palm-like tree about 15 ft., with flowers in stout cylindrical spikes, no. 695 (sterile) ; Kenya Colony, Uganda, Tanganyika and southwards to the Cape.

Umbelliferae.

Hydrocotyle.—*H. Mannii* Hook. f. ; 11,000 ft., by water, Tweedie 31 ; Aberdares and Kilimanjaro westwards to Ruwenzori, Cameroons Mt. and Fernando Po.

Alepidea.—*A. Fischeri* (Engl.) Schlect. et Wolff ; 10,200 ft., erect to 18 in., flowers white, no. 353 ; south-western Kenya Colony, southwards to Nyasaland and Katanga.

Sanicula.—*S. europaea* Linn. ; 8000 ft., erect to 15 in., flowers white, nos. 58 ; 691 ; high mountains of Tropical Africa and S. Africa, and in Europe, Asia, and America.

Trachydium.—*T. abyssinicum* (Hochst.) Benth. et Hook. f. ex Hiern ; 13,000–13,800 ft., rosette herb with compound umbels of creamy white flowers on short peduncles, no. 686 ; Abyssinia, Kenya, Aberdares, Mau, Nandi, Kilimanjaro and Shira Mts.

Pimpinella.—*P. Volkensii* Engl. ; 8000 ft., erect to 5 ft., flowers white, no. 37 ; Kenya, Aberdares, Kilimanjaro.

Anthriscus.—*A. dissectus* C. H. Wright ; 13,000 ft., herb 5–8 ft., flowers white, Tweedie 80 ; Ruwenzori and Virunga Mts.

Ferula.—*F. montis-Elgonis* Bullock* ; 12,000 ft., up to 7 ft., flowers cream, enclosed in pale green " bracts " (bases of undeveloped leaves) ; no. 425.

Peucedanum.—*P. Kerstenii* Engl. ; 11,500 ft., erect to 5 ft., flowers creamy yellow, No. 429 ; Kenya, Aberdares, Ruwenzori, Kilimanjaro, Shira and Virunga Mts.

Lefeburia.—*L. brevipes* Engl. ex Wolff ; 6500–7500 ft., erect to 10 ft., flowers deep crimson, fruits grey, no. 275 ; Busoga, Mpororo.

Heracleum.—*H. elgonense* (Wolff) Bullock * ; 11,650 ft., erect to 8 ft., flowers white, no. 405 ; Kenya.

Caucalis.—*C. gracilis* (Hook. f.) Wolff ex Mildbr. ; 7000 ft., erect, 30 in., flowers green, no. 245 ; Kenya Colony, Uganda, Tanganyika, Cameroons Mt.

Ericaceae.

Agauria.—*A. salicifolia* (Comm. ex Lam.) Hook. f. ; 10,500–11,500 ft., arbutus-like tree with creamy-pink bell-shaped flowers, no. 684 ; widely spread on all the mountains of Tropical Africa, and in the Mascarene Islands.

Erica.—*E. arborea* Linn. ; 10,200–12,000 ft., shrub to 20 ft., flowers white, no. 314 ; East African Mts.

Blaeria.—*B. elgonensis* Alm et Th. Fries jr. ; 12,000–13,000 ft., viscid shrublet up to 12 in., flowers purple or mauve, nos. 316 ; 483. *B. Granvikii* Alm et Th. Fries jr. ; 12,500 ft., erect shrublet to 1 ft., flowers mauvy pink, indumentum partly of subplumose hairs, not viscid, no. 685.

Ebenaceae.

Euclea.—*E. keniensis* R. E. Fries ; 6500–7500 ft., tree 20–30 ft., flowers pale green, fruit green, the root is used as a medicine for tapeworm by the Ul Kony, nos. 654 ; 669 ; Jackson 329a (" Shiendet ") ; Kenya Colony, eastern Uganda, and northern Tanganyika.

Myrsinaceae.

Myrsine.—*M. africana* Linn. ; 11,800 ft., box-like shrub to 6 ft., no. 366 ; eastern, southern Tropical and South Africa generally.

Loganiaceae.

Buddleja.—*B. polystachya* Fresen.; 6500–7500 ft., shrub to 15 ft., flowers orange, slightly scented, no. 217; East Africa as far south as Hanang Mt., and in Arabia.

Lachnopylis.—*L. congesta* (R. Br. ex Fresen.) C. A. Smith; 6500–7500 ft., tree 40–50 ft., flowers white, Jackson 340a ("Choruet"); East Africa southwards to Nyasaland and westwards to the Virunga Mts.

Oleaceae.

Jasminum.—*J. abyssinicum* R. Br.; 6500–7500 ft., climber to 25 ft., flowers pure white or tinged mauve, very sweet-scented; fruits black, nos. 141; 626; Jackson 319a ("Kipteiit"); East Africa westwards to the Virunga Mts.

Schrebera.—*S. alata* (Hochst.) Welw.; 6500–7500 ft., tree 30–40 ft. fruits obovoid, woody, splitting into 2 valves, Jackson 344a ("Kakawet"); Abyssinia, Nyasaland.

Olea.—*O. chrysophylla* Lam.; 6000–10,500 ft., tree to 20 ft., flowers greenish white, nos. 284; 473 (Wild Olive); East Africa westwards to Jebel Marra, Ruwenzori and Virunga Mts., eastwards to Arabia, and southwards to South Africa; also in Mauritius and Bourbon.

Apocynaceae.

Carissa.—*C. edulis* Vahl; 6500–7500 ft., spiny erect shrub to 20 ft., flowers strongly scented, white, pink below, fruits deep red, latex milky, very sticky, nos. 66; 276; Jackson 324a ("Nagatetwet"); Tropical Africa generally, extending to Arabia and Socotra.

Asclepiadaceae.

Asclepias.—*A. semilunata* (A. Rich.) N. E. Br.; 6700–10,000 ft., spreading shrub to 5 ft., with milky latex, flowers umbellate, dirty white or cream with maroon centre, fruits inflated, bladder-like, covered with long weak bristles, nos. 79; 372; 510; East Africa westwards to Niam-niam, and in Angola. *A. macrantha* Hochst.; 6000 ft., in swamp, erect to 18 in., leaves long-linear, flowers orange-red, no. 282; East Africa.

Schizoglossum.—*S. eximium* (Schlect.) N. E. Br.; 6600 ft., erect to 2 ft., leaves oblong, flowers cream, with conspicuous maroon corona, no. 570; Uganda, Sudan (Lado) and Nandi Plateau.

Margaretta.—*M. rosea* Oliv.; 6500–7500 ft., springing up immediately after grass fires, erect to 1 ft., flowers pink, orange or lemon, nos. 111; 112; 112a; Uganda, Sudan (Lado) and Nandi Plateau.

Sarcostemma.—*S. viminale* (Linn.) R. Br.; 6500 ft., twiner to 15 ft., leafless, with milky latex, no. 503; widely distributed in Tropical and South Africa.

Cynanchum.—*C. altiscandens* K. Schum. ; 6500 ft., slender twiner with pedunculate subumbels of small greenish flowers with a white tubular corona, no. 656a ; East Africa.

Tylophora.—*T. Lugardae* Bullock* ; 6500 ft., slender twiner, flowers in one or two clusters on the slender peduncle, green with a maroon centre, no. 656.

Sphaerocodon.—*S. obtusifolium* Benth. ; 7700 ft., shrub to 2 ft., flowers umbellate or almost fasciculate, maroon, no. 618 ; N. Nigeria, Ruwenzori, Rhodesia, Angola.

Marsdenia.—*M. Schimperi* (Hochst. MS) Decne. ; 6500 ft., creeper, flowers dirty white, scented, no. 599 ; Abyssinia, Eritrea, Kilimanjaro, and Mbulu and Kondoa districts of Tanganyika.

Rubiaceae.

Hymenodictyon.—*H. floribundum* (Hochst. et Steud.) B. L. Robinson ; 6500–7500 ft., deciduous tree to 15 ft., leaves turn scarlet before falling, flowers in terminal spikes, fruits capsular, no. 156 ; widely spread in Tropical Africa.

Pentas.—*P. carnea* Benth. ; 6500–7500 ft., erect to 3 ft., flowers pink (a white form also occurs), no. 105 ; East Africa southwards to Nyasaland. *P. longiflora* Oliv. ; 6500–7500 ft., erect to 6 ft., flowers white, no. 144 ; Kenya Colony, Uganda and Tanganyika westwards to Ruwenzori and the Virunga Mts. *P. Schimperiana* Vatke ; 9000 ft., shrub to 4 ft., flowers white tinged pink, no. 407 ; East Africa southwards to Nyasaland. *P. verticillata* K. Schum. ; 6500–7500 ft., erect to 3 ft., leaves in whorls of 3 or 4, flowers cream, no. 9 ; Kenya Colony, Uganda, Tanganyika, Nyasaland, N. Rhodesia and Angola.

Oldenlandia.—*O. abyssinica* (Hochst. ex A. Rich.) Hiern; 6500–7500 ft., erect to 2 ft., flowers scarlet, no. 100 ; East Africa, extending to West Africa, and N. and S. Rhodesia. *O. monanthos* (Hochst. ex A. Rich.) Hiern ; 8500–8650 ft., spreading herb to 2 ft., flowers solitary, pale mauve or pink, nos. 345 ; 494 ; Abyssinia, Kenya, Aberdares. *O. hedyotoides* (Fisch. et Mey.) Boiss. ; 6500–7500 ft., spreading herb to 8 in., flowers glomerulate, white, no. 231 ; Abyssinia to Upper Egypt, Uasin Gishu Plateau, Kipkarren, and in southern Tropical Africa westwards to N. W. Rhodesia. *O. scopulorum* Bullock* ; 7500 and 8250 ft., around rocks in open spaces, tufted herb 3–5 in., flowers white or pale mauve-pink, nos. 49 ; 346.

Pentanisia.—*P. Schweinfurthii* Hiern ; 6100 ft., erect herb from a woody rootstock, 6–9 in., flowers bright blue, no. 529 ; N. Nigeria, Niam-niam, Nandi, Moshi, Iringa, Livingstone Mts., Nyasaland, and Rhodesia westwards to Mwinilunga. *P. parviflora* Stapf MS. ; 6500–7500 ft., erect to 8 in., much branched, flowers blue, glomerate in the leaf-axils, nos. 17 ; 99 ; Serere (Uganda) and S. W. Kenya Colony.

Canthium.—*C. rubrocostatum* Robyns ; 6500–7500 ft., tree 20–30 ft. fruit green, leaves reddish below, *Jackson* 322 ; Kenya, Usambara.

Vangueria.—*V. apiculata* K. Schum. ; 6500–7500 ft., spreading tree to 20 ft., flowers green, nos. 234 ; 234a ; Sudan (Lado), Kenya Colony, Uganda, Tanganyika. *V. acutiloba* Robyns ; 6500–7500 ft., deciduous spreading tree 20–30 ft., flowers white or green, fruit edible, globose, 1¼ in. diam., light brown or yellow, nos. 571 ; Jackson 331a (" Kamolwet ") ; southern Uganda and Kenya Colony, and Kilimanjaro. *V. linearisepala* K. Schum. ; 6600 ft., shrub to 15 ft., flowers green, no. 622 ; southern Kenya Colony, and Kwai, Tanganyika.

Pavetta.—*P. Oliveriana* Hiern ; 6600 ft., spreading shrub to 8 ft., flowers white, stigma long-exserted, fruit black, no. 586, Sudan (Lado), Uganda and western Kenya Colony, and Kilimanjaro.

Coffea.—*C. eugenioides* S. Moore ; 6500 ft., in heavy forest shade, erect spreading shrub 10–15 ft., flowers cream, fruit deep crimson, nos. 310 ; 505 ; 505a (" Nandi " Coffee) ; Kenya Colony and Uganda forests westwards to Ruwenzori.

Anthospermum.—*A. Whyteanum* Britt. ; 11,500 ft., shrub to 10 ft., flowers pale yellow, no. 403 ; Aberdares, Kenya, Kilimanjaro, Usambara, etc., southwards to Nyasaland.

Rubia.—*R. longipetiolata* Bullock* ; 6500–7500 ft., climbing herb with small recurved prickles, flowers green, fruit black, no. 204 ; Eldama Ravine, Mau, and in Uganda.

Galium.—*G. mollicomum* Bullock* ; 11,000 and 11,800 ft., decumbent or tufted, leaves smooth, flowers yellow ; nos. 400 ; 400a. *G. afro-alpinum* Bullock* ; 10,000–12,000 ft., creeeping plant, leaves with the edges shortly recurved-aculeate, flowers pale yellow, no. 365.

Caprifoliaceae.

Sambucus.—*S. adnata* Wall. ex DC. ; 9800 ft., shrub to 10 ft., flowers white, no. 427 ; Kenya, Aberdares, also in the Himalaya.

Dipsacaceae.

Dipsacus.—*D. pinnatifidus* Steud. ; 8500 ft., erect to 8 ft., stems and leaf-veins very prickly, flowers capitate, white, no. 261 ; East Africa and Virunga Mts. as far south as Kilimanjaro.

Scabiosa.—*S. Columbaria* Linn. ; 8500–12,000 ft., erect, 10 in. to 2 ft., flowers capitate, mauve, nos. 342 ; 394 ; an extremely variable plant widely distributed in Eastern and South Tropical Africa, North Africa and Europe, and (?) in S. Africa.

Valeriana.—*V. elgonensis* Mildbr.; 13,500 ft., shrubby, 18 in., flowers puce, no. 404. Described from specimens collected by Granvik in 1920, this plant was first collected by Battiscombe (no. 676), who sent it to Kew in 1913. *V. Volkensii* Engl.; 10,000–11,500 ft., erect herb with lax terminal panicle, Tweedie B6; Kilimanjaro, Ruwenzori.

Compositae.

Erlangea.—*E. fusca* S. Moore; 10,200 ft., shrub to 6 ft., leaves silvery tomentose below, flowers mauve, no. 370; Aberdares. *E. tomentosa* S. Moore; 6500–7500 ft., coarsely tomentose, erect to 6 ft., flowers mauve, no. 106; Kenya Colony and Uganda southwards to Nyasaland.

Vernonia.—*V. afromontana* R. E. Fries; 7000 ft., erect shrub to 6 ft., flowers mauve; no. 252; Kenya, Aberdares. *V. amygdalina* Del.; 6500–7500 ft., in open spaces in forest country, shrub 10–15 ft., of open habit, spreading above, flowers white to mauve, Jackson 303 ("Cheburiandet"); widely distributed in Tropical Africa. *V. cistifolia* O. Hoffm.; 6500–7500 ft., erect to 7 ft., flowers purple, in very large terminal panicles, no. 8; Kenya Colony, Uganda, Tanganyika, westwards to Virunga Mts. and Bauchi Plateau, and southwards to N. E. Rhodesia, S. Rhodesia and Gazaland. *V. Grantii* Oliv.; 6500–7500 ft., erect to 3 ft., flowers purple and white, no. 32; Kenya Colony, Uganda, Iringi, and probably as far south as Nyasaland. *V. hymenolepis* A. Rich.; 6500–7500 ft., shrub to 10 ft., involucre white, flowers purple, no. 155; Abyssinia, Uasin Gishu Plateau and Uganda westwards to Ruwenzori. *V. jugalis* Oliv. et Hiern; 6500–7500 ft., shrub to 6 ft., flowers purple, no. 173; Sudan Congo, Uganda, Kenya Colony. *V. dumicola* S. Moore; 6500 ft., erect shrub to 6 ft., flowers mauve, involucral bracts mauve-tipped, no. 507; Uganda (Victoria Nyanza basin). *V. uniflora* Hutch. et J. M. Dalz.; 6500–7500 ft., shrub to 12 ft., flowers mauve, in very small uniflorous capitula, no. 235; Kenya Colony, Uganda, and Cameroons Mt. *V. pumila* Kotschy et Peyr.; 6100 ft., erect to 3 in., leafless at time of flowering, flowers clustered, purple, no. 523; Nandi, Madi, Sudan, westwards through Northern Nigeria to French Guinea. *V. Smithiana* Less.; 6500–7500 ft., erect herb. 8 in. to 2 ft., flowers pink; no. 442; Uganda, Kenya Colony, Tanganyika, westwards through French Sudan to French Guinea, and in Angola. *V. syringifolia* O. Hoffm.; 8000–10,000 ft., Tweedie 86; Kenya, Aberdares.

Adenostemma.—*A. caffr* DC.; 6500–7500 ft., in swampy places, spreading herb to 3 ft., flowers white, nos. 183; 574; widely distributed in the warm regions of both hemispheres.

Mikania.—*M. scandens* Willd.; 6500–7500 ft., climber to 20 ft., flowers white, no. 135; widely distributed in the warm regions of both hemispheres.

Dichrocephala.—*D. chrysanthemifolia* DC. ; 6500-7500 ft., erect herb to 2 ft., capitula globose, yellow-white, no. 241 ; widely distributed in warm regions of the Old World.

Microglossa.—*M. volubilis* (Wall.) DC. ; 6500–7500 ft., shrub 8–10 ft., often subscandent, flowers cream, nos. 174 ; 655 ; Tropical Africa generally, extending through Asia to China and Japan.

Conyza.—*C. aegyptiaca* (Linn.) Ait. ; 6500-7500 ft., erect herb to 4 ft., flowers yellowish white, no. 210 ; a tropical weed. *C. Newii* Oliv. et Hiern ; 9000 ft., erect woody herb to 5 ft., flowers pale cream, no. 401 ; Kenya, Aberdares, Virunga Mts., Kilimanjaro, Usambara Mts. *C. stricta* Willd. ; 6500–7500 ft., erect herb with simple stems, flowers yellowish-white, no. 31 ; Tropical Africa eastwards to India. *C. ruwenzoriensis* (S. Moore) R. E. Fries ; 11,000–12,000 ft., herb, woody below, to 3 ft., very like the last, but stems much branched, flowers yellow, nos. 312 ; 383 ; Ruwenzori, Virunga Mts., Athi Plains, Aberdares. *C. Schimperi* Sch. Bip. ; 8500 ft., erect to 3 ft., leaves pinnatipartite, segments linear, flowers yellow, no. 319 ; Abyssinia, mountains of Kenya Colony, Virunga Mts. *C. subscaposa* O. Hoffm. ; 7300 ft., rosette herb, flowering shoot almost leafless, with a terminal cluster of capitula, flowers pale yellow, no. 616 ; Kenya, Aberdares, Ruwenzori and Virunga Mts., westward to Cameroons Mt., and on Kilimanjaro, Usambara, and Hanang.

Laggera.—*L. brevipes* Oliv. et Hiern ; 6500–7500 ft., erect to 6 ft., stems winged, capitula in large terminal panicles, flowers purple, no. 119 ; widely spread from Kenya Colony and Uganda southwards to Rhodesia, and extending westwards to Angola and Lower Congo. *L. elatior* R. E. Fries ; 8000 ft., erect herb to 18 in., flowers pink ; no. 247 ; Kenya.

Sphaeranthus.—*S. suaveolens* DC. ; 6500–7500 ft., erect herb to 12 in., flowers purple, in globular heads, no. 94 ; Eastern Africa, from Egypt to Nyasaland. *S. angustifolius* DC. ; 6500–7500 ft., in swamps, spreading, to 18 in., flowers pale purple, in globular heads like the last, no. 177 ; Sudan southwards to Southern Rhodesia.

Helichrysum.—*H. Schimperi* (Sch. Bip. ex A. Rich.) Moeser ; 10,000 ft., shrub 5 ft., leaves and stems lanate, flowers pink in bud, opening yellow, nos. 126 ; 302 ; 420 ; East Africa southwards to Shire Highlands, and in Socotra. *H. fruticosum* (Forsk.) Vatke, var. *compactum* Vatke ; 12,000 ft., bush to 2 ft., leaves woolly, linear (almost ericoid), flowers yellow, capitula in small dense corymbs, no. 392 ; Abyssinia, Kenya, Aberdares, Kilimanjaro, Shira Mts., Hanang. *H. coriaceum* Sond. ; 6100 ft., erect, 1 ft. or more, capitula in a terminal corymb, flowers yellow, leaves 3-nerved, silvery below, no. 525 ; Kenya Colony, Uganda, Transvaal and south-eastern Cape. *H. declinatum* (Linn. f.) Less. ; 7000-8000 ft., erect, 4–12 in., leaves

linear-oblanceolate, silvery, flowers white, no. 57 ; eastern Tropical and South Africa. *H. Newii* Oliv. et Hiern ; 13,600 ft., shrubby, erect to 2 ft., leaves and stems woolly, capitula solitary, yellow in bud, opening cream, no. 386 ; Abyssinia, Kenya, Aberdares, Kilimanjaro, Shira Mts., Hanang, Virunga Mts. *H. aberdaricum* R. E. Fries ; about 13,000 ft., circular shrub to 2 ft., very woody below, leaves ericoid, woolly, forming terminal rosettes on the vegetative shoots, capitula very numerous, each terminal on a leafy peduncle, white, no. 384; Aberdares. *H. armatum* Mattf. ; 12,500 ft. to summit, shrubby, spiny, capitula white, foliage very like the preceding, Tweedie 95. *H. amblyphyllum* Mattf. ; 13,600 ft., shrub to 2 ft., leaves linear, yellowish-woolly, capitula numerous, subcorymbose, pink outside, white inside, nos. 385 ; 385a. *H. nandense* S. Moore ; 8500 ft. and upwards, shrub to 8 ft., leaves linear, sessile, auriculate, not woolly, capitula cormybose, white, no. 54 ; Kenya and Aberdares, Mau, Nandi and Uasin Gishu Plateaux, Virunga Mts. *H. lycnophorum* Mattf. ; 12,000–13,000 ft., shrub to 2 ft., leaves narrowly triangular, amplexicaule, not woolly, capitula in terminal corymbs, pink, no. 461, Kenya, Aberdares, Kilimanjaro. *H. Meyeri-Johannis* Engl. ; 10,300–11,500 ft., erect to 18 in., leaves woolly, stems simple, capitula solitary or few in a terminal cluster, at first pink, becoming white in age, nos. 387 ; 388 ; Kilimanjaro. *H. formosissimum* Sch. Bip. ex A. Rich. ; 8600–11,800 ft., erect to 3 ft., stems glandular, leaves not woolly, oblong, amplexicaule, capitula corymbose, pink in bud, opening white, nos. 264 ; 390 ; Abyssinia, Kenya, Aberdares, Ruwenzori, Virunga Mts. *H. kilimanjari* Oliv. et Hiern ; 11,500 ft., shrubby, about 1 ft., leaves woolly, at least below, capitula corymbose, yellow, no. 389 ; Kilimanjaro, Shira Mts., Usambara and Pare Mts. *H. setosum* Harv. ; 8000–8500 ft., erect to 5 ft., leaves thinly herbaceous, not woolly, stems and leaves glandular, capitula large, yellow, nos. 85 ; 391 ; Kenya Colony and Uganda westwards to Ruwenzori and Virunga Mts., and southwards to the Cape. *H. rosmarinum* Mattf. ; 13,000 ft., erect to 18 in., leaves and stem silvery-tomentose, capitula small, in dense terminal corymbs, yellow, no. 311a. *H. globosum* Sch. Bip. ex A. Rich. ; 6500–7500 ft., erect to 3 ft., glabrous, capitula small, in dense subglobose terminal corymbs, white, no. 250 ; eastern Tropical Africa, and on the Cameroons Mt.

Stoebe.—*S. kilimandscharica* O. Hoffm. ; 10,000 ft., ericoid shrub, to 15 ft., stems wiry, flowers golden, no. 315; Kenya, Aberdares, Kilimanjaro.

Inula.—*I. macrophylla* Sch. Bip. ; 6500–7500 ft., erect to 8 ft., leaves large, densely softly tomentose below, flowers orange, no. 293 ; Abyssinia, Mau and Uasin Gishu Plateaux, Uganda, Usambara.

Anisopappus.—*A. africanus* (Hook. f.) Oliv. et Hiern ; 6500–7500 ft., erect to 4 ft., flowers yellow, about 1 in. diam., no. 146 ; widely distributed in Tropical Africa.

Wedelia.—*W. abyssinica* Vatke ; 6500–7500 ft., shrub to 20 ft., flowers yellow, ray florets up to 1 in. long, no. 147 ; Abyssinia, Kenya, Athi Plains, Kilimanjaro.

Melanthera.—*M. pungens* Oliv. et Hiern ; 6500–7500 ft., leaves ovate, crenate-serrate, very scabrid, flowers yellow, rays rather inconspicuous, no. 147a [collected without notes with *Wedelia abyssinica*] ; Abyssinia, Sudan, Niam-niam.

Guizotia.—*G. oblonga* (Hutch.) Hutch. et Bullock ; 6500–7500 ft., erect to 4 ft., leaves twisted, flowers golden yellow, no. 96 ; S. W. Kenya Colony, Uganda.

Spilanthes.—*S. Acmella* Linn. ; 6500–7500 ft., ground creeper, rooting at the nodes, flowers orange, no. 179 ; widely spread in all warm regions of the Old World.

Coreopsis.—*C. coriacea* O. Hoffm. ; 6500–7500 ft., herb, erect to 6 ft., leaves serrate-dentate, flowers golden, rays 1 in. long, disc 1 in. diam., no. 6 ; Kenya Colony westwards to Ruwenzori. *C. elgonensis* Sherff ; 11,700 ft., herb to 2 ft., stems subsimple, leaves doubly deeply trifid, flowers yellow, about 2 in. diam., no. 327a.

Bidens.—*B. pilosa* Linn. ; 6500–7500 ft., erect herb, 2½ ft., ray florets white, disc yellow, achenes black, with 2 or 3 horns bearing reflexed barbs, no. 95 (" Black Jack ") ; a common tropical weed.

Galinsoga.—*G. parviflora* Cav. ; 6500–7500 ft., erect herb to 2½ ft., ray florets white, disc orange, no. 107 ; native of America and now naturalised throughout temperate and warm regions ; a weed of cultivation.

Tagetes.—*T. minuta* Linn. ; 6500–7500 ft., erect herb to 2 ft., leaves pinnate, pinnae serrate or linear and entire, flowers pale yellow, with the odour of " African Marigold," no. 132 ; native of America, now widely distributed as a weed.

Anthemis.—*A. abyssinica* Gay ex A. Rich. ; 10,200–13,000 ft., a decumbent herb, leaves much dissected, ray florets white, disc yellow, no. 381 ; Abyssinia, N. W. Kenya Colony, Aberdares, Mau Plateau, Moshi.

Artemisia.—*A. afra* Jacq. ; 6500–11,800 ft., erect to 10 ft., foliage silvery, flowers yellow, nos. 77 ; 465 ; East Africa, southern Tropical and South Africa.

Gynura.—*G. cernua* (Linn. f.) Benth. ; 6500–7500 ft., erect to 2 ft., capitula solitary on long erect peduncles with a very few reduced leaves, flowers purple, no. 439 ; widely spread in Tropical Africa, and in the Mascarene Islands. *G. vitellina* Benth. ; 6500–7500 ft., spreading to 4 ft., capitula solitary on long peduncles, flowers orange, no. 190 ; widely spread in Tropical Africa. *G. crepidioides* Benth. ; 6500–7500 ft., erect to 2½ ft., capitula in drooping corymbose cymes,

flowers russet, no. 108 ; widely spread in Tropical Africa, and in the Mascarene Islands. *G. amplexicaulis* Oliv. et Hiern ; 6500–7500 ft., erect to 3 ft., leaves linear-oblong, amplexicaule, capitula erect, up to about 6 in a terminal panicle, flowers brick red, no. 240 ; West African grasslands, E. Sudan. *G. scandens* O. Hoffm. ; spreading (or climbing) to 3 ft., capitula crowded, flowers orange, no. 211 ; East African Mountains, Angola. *G. montuosa* (S. Moore) Bullock* ; 8000–10,000 ft., in shade, erect to 5 ft., capitula corymbose, flowers yellow, nos. 44 ; 258 ; 350a ; widely spread in Tropical Africa, particularly in Kenya Colony.

Cineraria.—*C. kilimandscharica* Engl. ; 10,200 ft., to 4 ft., leaves triangular, doubly dentate, capitula radiate, yellow, no. 301 ; mountains and high plateaux of Kenya Colony and Tanganyika, and on the Virunga Mts. *C. laxiflora* R. E. Fries ; 11,000–13,500 ft., erect herb up to 3 ft., Tweedie 78 ; Aberdares.

Emilia.—*E. integrifolia* Baker ; 6500–7500 ft., associated with herbaceous *Lobelia* in open ground, up to 2 ft., but usually less than 1 ft., leaves linear, flowers purple, no. 101 ; western Kenya Colony, westwards to Ankole, and southwards to N. Rhodesia.

Notonia.—*N. abyssinica* A. Rich. ; 6500 ft., very succulent herb to 5 ft., flowers terra-cotta red, no. 116 ; Abyssinia, Kenya Colony, Uganda and north-eastern Tanganyika (?) and in Nyasaland.

Senecio.—*S. elgonensis* Th. C. E. Fries ; 12,000 ft., tree, leaves bright green, almost glabrous, petiole winged, nos. 437 ; 696 ; 699. *S. Gardneri* Cotton* ; 13,600 ft., tree, leaves densely white-tomentose below, petiole cylindrical, woolly, nos. 438 ; 697 ; 700 ; 701.† *S. multicorymbosus* Klatt ; 8000 ft., branching shrub to 15 ft., capitula in dense panicles, flowers yellow, no. 521 ; Kenya Colony, Uganda, Imatong Mts., Tanganyika, Virunga Mts., Angola. *S. discifolius* Oliv. ; 6500–7500 ft., erect herb to 18 in., leaves glaucous, broadly spathulate, flowers yellow, no. 76 ; Kenya Colony, Uganda, Tanganyika, Rhodesia. *S. ruwenzoriensis* S. Moore ; 7300 ft., erect to 2 ft., leaves sessile, elliptic, entire, succulent, capitula radiate, yellow, laxly corymbose, no. 631 ; Aberdares westward through Uganda to Ankole, Ruwenzori and Virunga Mts., and probably also in the Livingstone Mts. *S. Lugardae* Bullock* ; 6700 ft., erect herb to 18 in., leaves oblong-spathulate, herbaceous, glabrous, capitula discoid, buff, no. 541. *S. caryophyllus* Mattf. ; 11,700–13,500 ft., scapigerous herb, about 3 in., leaves linear, flowers yellow, no. 360. *S. rhamnatophyllus* Mattf. ; 11,500 ft., shrubby, to 2 ft., leaves linear-filiform, capitula radiate, corymbose, no. 306 ; western Kenya

†A juvenile form of this, No. 698, with the underside of the leaves less tomentose, was also collected. In addition a further species of this interesting group, *S. amblyphyllus* Cotton, occurs in the bamboo forest zone. By an oversight this name was published in *K.B.* 1932, 473, with the incorrect spelling "amblyophyllus."

Colony. *S. Snowdenii* Hutch. ; 10,000 ft., erect herb 2–3 ft., leaves linear, viscid, subentire, capitula yellow, radiate, no. 371. *S. sotikensis* S. Moore ; 13,000 ft., bush to 3 ft., very viscid, leaves pinnatifid, oblong ; capitula radiate, yellow, no. 416.

Euryops.—*E. elgonensis* Mattf. ; 12,800 ft., shrub to 4 ft., leaves linear, crowded, capitula radiate, yellow, no. 368 ; Aberdares.

Tripteris.—*T. Vaillantii* Decne. ; 8700 ft., erect viscid herb to 2 ft., capitula radiate, yellow, achenes winged, no. 262 ; Abyssinia, Somaliland, Red Sea Hills to Gebel-Marra, Kenya Colony, Kilimanjaro, extending to Sinai.

Landtia.—*L. Rueppellii* (Sch. Bip.) Benth. et Hook. f. ex Vatke ; 9000 ft., scapigerous rosette herb, leaves closely adpressed to soil, scapes 3 in., woolly, capitula radiate, yellow, no. 417 ; Abyssinia, Kilimanjaro, and probably also Kenya and Aberdares.

Berkheya.—*B. Spekeana* Oliv. ; 6500–7500 ft., erect to 4 ft., leaves sessile, pungent-lobate, woolly below, setose-scabrid above, capitula radiate, yellow, no. 7 ; Cameroons Mt., Sudan, Uganda, and common on the mountains and plateaux of Kenya Colony and northern Tanganyika.

Echinops.—*E. amplexicaulis* Oliv. ; 8000 ft., erect to 5 ft., leaves broad, elliptic, lobate-dentate, lobes spine-tipped, thinly woolly below, capitula in globose heads, flowers crimson, no. 82 ; Bongo, Uganda, southern Kenya Colony and Mbulu Distr. (Tanganyika). *E. eryngiifolius* O. Hoffm. ; 6000 ft., erect to 3 ft., leaves linear, dense, parallel-nerved, margins densely spiny, flowers green, no. 553 ; Nandi Plateau, Bukoba Distr. *E. angustilobus* S. Moore ; 8000 ft., erect to 5 ft., stems woolly at first, leaves pinnatipartite, lobes linear, spine-tipped, often again divided, woolly below, flowers greyish-white, nos. 81 ; 462 ; Kenya, Uasin Gishu and Mau Plateaux. *E. brevisetus* S. Moore ; 6500–7500 ft., erect to 3 ft., stems woolly, leaves (the lower at least) very large, multipartite, lobes linear to linear-lanceolate, spine-tipped, woolly below, setose-scabrid above, no. 158 ; Ruwenzori southwards to Kigesi.

Carduus.—*C. nanus* R. E. Fries ; 8500 ft., a rosette thistle with sessile heads of white to pale mauve or pale pink flowers, no. 406 ; Aberdares. *C. kikuyorum* R. E. Fries ; 8000 ft., thistle, erect to 5 ft., flowers pale mauve, no. 257 ; mountains and high plateaux of Kenya Colony, Uganda and northern Tanganyika, westwards to Ruwenzori and the Virunga Mts. *C. leptacanthus* Fresen. ; thistle, erect to 8 ft., leaves with very long spines, capitula congested, flowers purple, no. 191 ; Abyssinia, Ruwenzori, Ruanda. *C. keniensis* R. E. Fries, var. *elgonensis* R. E. Fries ; 11,750–13,000 ft., thistle, basal rosette forming a cushion, flower shoots erect to 3 ft., with a large dense head of capitula, flowers mauve, the whole plant very densely spiny, no. 484.

Centaurea.—*C. rhizocephala* Oliv. et Hiern ; 6100 ft., perennial herb, 3 in., involucral bracts spine-tipped, flowers purple, no. 522 ; N. Nigeria, Bongo, Uganda, Kenya Colony, Nyasaland and Rhodesia.

Gerbera.—*G. abyssinica* Sch. Bip. ex A. Rich. ; 6700 ft., appearing in grassland after burning, scapigerous rosette herb about 1 ft. high, leaves rounded at the base, long petiolate, ray florets pink or red, disc white, no. 515 ; East Africa southwards to Portuguese E. Africa and westwards to Angola. *G. piloselloides* (Linn.) Cass. ; 6500–7500 ft., scapigerous rosette herb up to 20 in., scapes swollen towards the apex, leaves subsessile, narrowed to the base, ray florets pale purple or pink, disc white, nos. 218 ; 615 ; widely distributed in Africa, extending eastwards to Malaya and the Far East, and in Tasmania.

Crepis.—*C. carbonaria* Sch. Bip. ; 11,000 ft., small scapigerous herb, flowers yellow, Tweedie 26 ; Abyssinia, Athi Plains, Mt. Hanang.

Lactuca.—*L. taraxacifolia* Schum. et Thonn. ; 6500–7500 ft., erect to 2 ft., flowers mauve, no. 287 ; widely spread from Upper Guinea to Abyssinia, Uganda and Kenya Colony. *L. capensis* Thunb. ; 8000–11,400 ft., erect to 1 ft., flowers mauve, nos. 259 ; 336a ; 358 ; widely spread in Tropical and South Africa, and in Madagascar. *L. abyssinica* Fresen. ; 6500–7500 ft., erect to 8 ft., flowers mauve, no. 203 ; Abyssinia, Sudan, Niam-niam, Mittu, Uganda, Kenya Colony and probably also in southern Tropical Africa westwards to Angola.

Sonchus.—*S. oleraceus* Linn. ; 6500–7500 ft., erect to 2 ft., flowers yellow, no. 457 ; widely distributed in all warm and temperate regions. *S. Schweinfurthii* Oliv. et Hiern ; 6500–7500 ft., erect, 1–7 ft., cauline leaves sagittate-auriculate, flowers yellow, nos. 195 ; 546 ; Monbuttu, Uganda, Kenya Colony, Kilimanjaro, Nyasaland and westwards to Angola. *S. afromontanus* R. E. Fries ; 11,000 ft., subscapigerous herb with a head of capitula, outer bracts of the involucre tomentose with reddish-purple hairs, Tweedie 25. *S. Elliotianus* Hiern ; 6700 ft., flowers appearing before the leaves, immediately after burning of grasslands, 1–4 in. high, flowers yellow, no. 518 ; West Africa (Sierra Leone, Gold Coast, N. Nigeria), Sudan, Uganda, Tanganyika, Nyasaland and Katanga westwards to Angola.

Gentianaceae.

Sebaea.—*S. Schimperiana* Buching. ex Schweinf. ; 11,700 ft., erect to 8 in., flowers yellow, no. 415 ; Abyssinia, Aberdares. *S. leiostyla* Gilg ; 8000 ft., erect to 2 ft., flowers yellow, no. 41 ; Kenya, Aberdares, Upare and Pare Districts, and in Nyasaland.

Chironia.—*C. elgonensis* Bullock* ; 6500–7500 ft., in one swamp only, erect herb to 4 ft., flowers in large lax terminal cymes, crimson, no. 21 ; also at Kipkarren.

Swertia.—*S. kilimandscharica* Engl. ; 11,400 ft., in shade, erect to 5 ft., flowers in lateral and terminal cymes, mauve, veined purple, no. 374 ; Aberdares, Kilimanjaro, Shira, Meru, Virunga Mts. *S. Lovenii* Th. Fries jr. ; collected with the preceding, flowers and stems purple, no. 374a. *S. Sharpei* N. E. Br. ; 7500 ft., in open swampy ground, erect to 14 in., flowers in terminal and lateral cymes, white, nos. 22 ; 46 ; Kenya Colony and Uganda southward to Nyasaland and Portuguese East Africa. *S. Lugardae* Bullock* ; 11,800 ft., an erect rock plant up to 6 in. high, flowers white with purple stripes, no. 409 ; Aberdares. *S. uniflora* Mildbr. ; 13,600 ft., stoloniferous rosette herb, peduncles leafy, up to 3 in., with a solitary dark purple or white flower, no. 377. *S. Dummeriana* Th. Fries jr. ; stoloniferous rosette herb, peduncles about 2–6 in., leafy, 2–14-flowered, flowers lilac, veined purple, no. 414 ; the root is used medicinally by natives.

Primulaceae.

Lysimachia.—*L. africana* Engl. ; 8250–11,500 ft., near water, herb to 18 in., flowers pale pink in dense terminal racemes, nos. 317 ; 318 ; Kenya Colony and Uganda, southwards to the Transvaal.

Anagallis.—*A. serpens* Hochst. ex DC. ; 11,650 ft., a creeping bog plant, flowers axillary, pale pink, no. 325a ; high mountains of East Africa southwards to Mt. Milanji.

Plumbaginaceae.

Plumbago.—*P. montis-Elgonis*, Bullock* ; 6500 ft., herb of moist shady places, leaves decurrent to the auriculate base, inflorescence glandular, flowers magenta, no. 657.

Plantaginaceae.

Plantago.—*P. palmata* Hook f. ; 6600 ft., near water, rosette herb, leaves suborbicular, long-petiolate, palmatilobed, spikes raised on scapes about 9 in. high, no. 639 ; widely distributed on the mountains of Tropical Africa.

Campanulaceae.

Lightfootia.—*L. abyssinica* Hochst. ; 6500–7500 ft., erect to 2 ft., flowers purple and white, no. 199 ; widely spread in eastern and southern Tropical Africa.

Wahlenbergia.—*W. arabidifolia* (Engl.) Brehm. ; 11,600 ft., erect herb, 6–8 in., flowers pale blue, no. 322a ; widely distributed in Tropical Africa.

Lobeliaceae.

Lobelia.—*L. Giberroa* Hemsl. ; 8200 ft., erect to 18 ft., with milky latex, flower spike 5–6 ft. long, bracts not much longer than the mauve flowers, nos. 519 ; 1a ; East African mountains westward to Ruwenzori and Virunga Mts. *L. Telekii* Schweinf. ; 13,600 ft., erect to 5 ft., thick yellow latex, no leaves at the base, bracts ciliate,

very much longer than the dark purple flowers, nos. 435 ; 436 ; Kenya, Aberdares. *L. aberdarica* R. E. et Th. Fries jr. ; 9200 ft., near water, erect to 9 ft., bracts lanceolate-elliptic, short, flowers mauve, no. 434 ; Aberdares. *L. elgonensis* R. E. et Th. Fries jr. ; 13,400–13,600 ft., a cabbage-like plant, no flower spike seen, no. 2a. *L. Lindblomii* Mildbr. ; 10,300–13,600 ft., small creeping herb, flowers bright blue, nos. 432 ; 433. *L. stellarioides* Benth. et Hook. f.; spreading herb to 15 in., flowers buff, no. 469 ; East Africa. *L. fervens* Thunb. ; 6500–7500 ft., spreading herb to 8 in., flowers blue, no. 149 ; widely spread in Tropical and South Africa.

Boraginaceae.

Ehretia.—*E. silvatica* Gürke ; 6500–7500 ft., spreading shrub or tree up to 30–40 ft., flowers greenish-white in corymbose cymes, fruits orange-red, nos. 498 ; 554 ; 554a ; Jackson 305a (" Minyan-uruwet ") ; widely spread in Kenya Colony, Uganda and Tanganyika.

Trichodesma.—*T. physaloides* (Fenzl ex Endl.) A. DC. ; 6700 ft., erect herb to 18 in., flowers white, calyx bladder-like in fruit, no. 545 ; East Africa southwards to South Africa and westwards to Northern Nigeria.

Cynoglossum.—*C. coeruleum* Hochst. ex DC. ; 9000 ft., branching herb, erect to 3 ft., flowers bright blue, no. 398 ; East Africa. *C. lanceolatum* Forsk. ; 6500–7500 ft., erect herb to 18 in., flowers white with blue centre, no. 175 ; widely spread in Tropical Africa, and in South Africa, Orient, eastwards through India and Malaya to China and Japan.

Myosotis.—*M. sylvatica* Hoffm. ; 11,700 ft., erect herb to 2 ft., flowers bright blue, no. 399 ; Abyssinia, Red Sea Hills, Aberdares, southwards to Livingstone Mts., and in South Africa, and westwards to the Cameroons Mt., also in Europe, Western Asia and Canary Is.

Lithospermum.—*L. officinale* Linn. ; 11,400 ft., shrub to 3 ft., flowers pale yellow, pyrenes white, shining, no. 376 ; eastern Africa, and widely spread in the north temperate zone.

Solanaceae.

Discopodium.—*D. penninervium* Hochst. ; 9000 ft., shrub to 8 ft., flowers grey, in axillary fascicles, no. 426 ; widely spread in East Africa, extending westward to Virunga Mts., Cameroons Mt. and Fernando Po, and southwards to Nyasaland.

Physalis.—*P. peruviana* Linn. ; 6700 ft., cultivated ground and in the bush, spreading, to 3 ft., flowers yellow, bladder-like fruiting calyx brown, no. 641 (Cape Gooseberry) ; widely distributed, native of South America, and now naturalised in many parts of Tropical and South Africa.

Solanum.—*S. panduriforme* E. Mey. ; 6500–7500 ft., shrub to 8 ft., leaves and stems densely stellate-tomentose, old wood thorny, flowers large, mauve, fruit yellow, 1½ in. diam., no. 90 ; Uganda and Kenya Colony southwards to Portuguese East Africa, westwards to Angola, and in South Africa. *S. nigrum* Linn. ; 6500–7500 ft., and 11,800 ft., spreading herb to 3 ft., flowers small (the specimen from the higher altitude (no. 492) has very large flowers for this species), white, in small extra-axillary racemes, leaves ovate, acuminate, entire to deeply dentate, thinly pubescent with simple hairs, nos. 209 ; 492 ; widely spread as a weed in warm and temperate regions. *S. indicum* Linn. ; 6500–7500 ft., erect to 5 ft., armed with recurved prickles, leaves more or less lobulate-sinuate, densely stellate-pubescent, flowers small, white, fruits red, the size of a pea, no. 291 ; widely spread throughout the Old World tropics, extending to the Philippines. *S. aculeastrum* Dunal ; 7200 ft., spreading shrub to 20 ft., armed with stout straight or recurved prickles, leaves lobate-sinuate, white-stellate-tomentose below, glabrescent above, flowers white, about 1 in. diam., fruit lemon-shaped and lemon-yellow, no 238 ; Uganda, Kenya Colony southwards to South Africa, and westwards to Angola. *S.* sp. ; 8000–9000 ft., erect to 3 ft., strongly armed with straight prickles, flowers large, rich purple, no. 35 ; this may represent an undescribed species.

Convolulaceae.

Ipomoea.—*I. blepharophylla* Hall. f. ; 6500–7500 ft., a twining herb with white and purple flowers 2 in. long, leaves narrowly lanceolate, 2 in. long, no. 73 ; widely distributed in Tropical Africa. *I. tenuirostris* (Steud. MS.) Choisy ; 6500–7500 ft., twining herb, flowers white with a purple centre, 1½ in. long, leaves broadly ovate, deeply cordate at the base, no. 189 ; East Africa and Nyasaland. *I. Wightii* (Wall.) Choisy ; 6500 ft., twiner with milky latex, flowers mauve, 1½ in. long, in rather congested cymes raised on peduncles about 6 in. long, leaves ovate, cordate at the base, white-tomentose below, no. 290 ; East and South Africa, Madagascar and Tropical Asia. *I. cairica* (Linn.) Sweet ; 6500–7500 ft., ground creeper, leaves digitately divided almost to the base, flowers mauve, 1½ in. long, no. 297 ; widely spread in the tropics of both hemispheres, and in Egypt and South Africa. *I. pachypus* Pilger ; 6700 ft., dwarf ground creeper, leaves deeply palmately divided into linear segments, flowers solitary, purple, 1½ in. long, shortly stalked, no. 590 ; described from a Somaliland specimen (Ellenbeck 1209). This was determined by Prof. R. Pilger, to whom the writer is indebted.

Convolvulus.—*C. sagittatus* Thunb. var. *abyssinicus* (Hall. f.) Baker et Rendle ; 6500–7500 ft., a twining herb with rather small pink flowers, no. 168 ; an extremely polymorphic variety widely distributed in East Africa, Nyasaland and westwards to Angola, and in N. Nigeria ; the leaves are always deeply sagittate.

Cuscuta.—*C. kilimanjari* Oliv. ; 6500 and 7200 ft., twining parasite on *Hypoestes verticillaris* (see below), with crimson stems and cream or yellow flowers, nos. 514 ; 583 ; found on various species of Acanthaceae on the mountains and plateaux of Kenya Colony southwards to the Livingstone Mts.

Scrophulariaceae.

Celsia.—*C. brevipedicellata* Engl. ; 6500 ft. (?), erect herb to 4 ft., flowers yellow, no. 13 ; Kilimanjaro, Meru, Mbulu and Karagwe Districts. *C. scrophulariifolia* Hochst. ex A. Rich. ; 11,800 ft., erect herb to 3 ft., flowers yellow, no. 491 ; Abyssinia, Kenya Colony and westwards to Ruwenzori.

Halleria.—*H. lucida* Linn. ; 8500 ft., tree to 20 ft., flowers orange, fruits green, fleshy, nos. 341a ; 496 ; Abyssinia southwards to South Africa and westwards through Nyasaland to Angola.

Craterostigma.—*C. plantagineum* Hochst. ; 6500–7500 ft., on rocks, rosette herb, flowers deep purple-mauve to almost white, several on a scape or apparently solitary on slender pedicels, nos. 160 ; 160a ; widely spread from Abyssinia, Eritrea and Arabia southwards to the Transvaal and westwards through Nyasaland and Rhodesia to Angola.

Lindernia.—*L. lobelioides* (Oliv.) Engl. ; 6500–7500 ft., in swampy ground, erect *Lobelia*-like herb with purplish blue flowers (rarely pure white), no. 148 ; Abyssinia and the Sudan southwards to Nyasaland.

Ilysanthes.—*I. pusilla* (Oliv.) Urban ; 6900 ft., on rocks, erect herb about 1½ in., flowers pinkish-mauve, no. 652 ; Karagwe, Chagwe, Ngong, Kipkarren.

Veronica.—*V. abyssinica* Fresen. ; 7000–8000 ft., erect herb, flowers blue, in axillary racemes, no. 47 ; Abyssinia and the East African mountains and plateaux southwards to the Livingstone Mts., and westward to the Virunga Mts. and Cameroons Mt. *V. myrsinoides* Oliv. ; 11,800 and 12,000 ft., creeping herb, flowers solitary, axillary, pale blue, young parts glandular, nos. 396 ; 412 ; 486 ; Kilimanjaro and Shira Mts., and probably also Kenya and Aberdares. *V. glandulosa* Hochst. ex Benth. ; 13,000–13,500 ft., glandular herb, Tweedie 68 ; Abyssinia, Ruwenzori, Virunga Mts., and probably also on the Aberdares.

Alectra.—*A. asperrima* Benth. ; 6500–7500 ft., erect herb to 16 in., flowers yellow, leaves scabrid, no. 102 ; Abyssinia and Eritrea, Kenya, Nandi Plateau, E. Kilimanjaro.

Cycniopsis.—*C. obtusifolia* Skan ; 6500–7500 ft., ground creeper, flowers with a long narrow tube bent at the top, and spreading limb

about 1 in. diam., pink, with a more uncommon white form, no. 3 ; Nairobi, Nandi, Eldoma Ravine, Kikuyu.

Rhamphicarpa.—*R. tenuisecta* Standley ; 9500–11,000 ft., creeping herb, leaves pinnatisect, segments filiform, flowers pink, fruits with a curved beak, no. 349; mountains and plateaux of Kenya Colony. *R. Jamesii* Skan ; 6000 ft., in a swamp (one place only) erect to 2½ ft., leaves linear, subentire, 4 in. or more long, flowers pure white, subsessile in the axils of the reduced upper leaves, no. 444 ; Kavirondo, Unyoro, Nyanza basin on the Kenya Colony and Tanganyika sides. *R. Herzfeldiana* Vatke ; 6500–7500 ft., erect or climbing to 4 ft., leaves broadly ovate, dentate, flowers cream flushed with pink, long-pedicellate, scattered, in the axils of normal leaves ; no. 4 ; grasslands of Kenya Colony, Uganda, and northern Tanganyika. *R. Heuglinii* Hochst. ex Schweinf. ; 6500–7500 ft., in swampy ground (in one place only), ground creeper, leaves linear, distantly toothed, flowers pale pink or white, long-pedicellate ; no. 139 ; East Africa and the Sudan, and probably also in the Shire Highlands.

Cycnium.—*C. adonense* E. Mey. ex Benth. ; 6100 ft., ground creeper, flowers with a long hairy tube 2½ in. long, limb spreading, 2 in. diam. pale yellow and brick red in bud, pure white when fully open, turning pale mauve and finally black, no. 568 ; a very variable plant extending from the Sudan, Uganda, and Kenya Colony southwards through Portuguese East Africa and Rhodesia to South Africa.

Sopubia.—*S. trifida* Buch.-Ham. ex Don ; 7000–8000 ft., erect herb to about 18 in., leaves trifid, segments linear, flowers yellow, no. 48 ; widely distributed in the tropics of the Old World, extending to Australia. *S. ramosa* (Hochst.) Hochst. ; 6500–7500 ft., erect somewhat scabrid undershrub to 3 ft., leaves linear, whorled, flowers purple, pink, or white with a deep purple spot at the base of each lobe, nos. 61 ; 131 ; widely distributed throughout Tropical Africa.

Bartsia.—*B. abyssinica* Hochst. ex Benth. ; 6500–8500 ft., erect to 4 ft., somewhat scabrid, flowers white tinged with pink, or purple and white, nos. 53 ; 140 ; 693 ; Abyssinia. *B. Petitiana* (A. Rich.) Hemsl. ; 12,000 ft., erect herb to 1 ft., flowers mauve-pink, nos. 326 ; 412a ; high grasslands of East Africa. *B. similis* Hemsl. ; 11,800 ft., glandular shrub to 3 ft., flowers pale yellow, no. 490 ; Aberdares, Kilimanjaro, Ruwenzori, Virunga Mts. *B. kilimandscharica* Engl. ; 12,000 ft., shrub to 4 ft., flowers greenish-yellow, no. 367 ; Kenya, Kilimanjaro, Shira Mts.

Acanthaceae.

Thunbergia.—*T. alata* Boj. ex Sims ; 6500–9000 ft., twining herb with solitary long pedicellate axillary lemon, orange, russet or pink

flowers, leaves more or less sagittate-ovate, petiole winged or wingless, nos. 52 ; 201 ; widely distributed in all warm regions, and often cultivated. *T. Paulitschkeana* G. v. Beck. ; 6700 ft., trailing or climbing herb, flowers orange, very like the preceding, but leaves not sagittate, no. 551 ; Somaliland, Elburgon, Mau.

Hygrophila.—*H. longifolia* (Linn.) Kurz ; 6500–7500 ft., erect herb to 18 in., leaves linear-lanceolate, flowers in dense whorls, blue, some of the bracts reduced to stout spines ; no. 182 ; widely distributed in Tropical Africa, India and Ceylon.

Ruellia.—*R. patula* Jacq. ; 6500–7500 ft., dwarf, procumbent or ascending, flowers in small cymes or apparently solitary, pale purple or mauve, nos. 186 ; 543 ; widely distributed in Tropical Africa.

Mimulopsis.—*M. spathulata* C. B. Clarke ; 8000 ft., erect to 6 ft., flowers white, tinged purple, funnel-shaped, 1 in. long, in lax terminal leafy panicles, no. 42 ; Mau Plateau, Mengo, Toro.

Acanthus.—*A. pubescens* (Oliv.) Engl. ; 7100 ft., in fairly open situations, shrub to 8 ft., leaves very spiny, flowers in terminal panicles of spikes, mauve-pink ; no. 233 ; Kenya Colony, Uganda, N. Tanganyika. *A. eminens* C. B. Clarke ; 6500 ft., in dense shade of forest, shrub to 10 ft., leaves spiny, flowers in spikes as above, rich purple-blue, no. 232 ; mountains and plateaux of Kenya Colony.

Barleria.—*B. grandicalyx* Lindau ; 6100–7500 ft., erect to 18 in., flowers purple or mauve, solitary, one calyx-segment much enlarged, nos. 68 ; 71 ; 526 ; probably widely distributed in eastern Tropical Africa, extending westwards to Angola. *B. Stuhlmannii* Lindau ; 6500–7500 ft., shrub to 12 ft., flowers mauve, no. 130 ; Kenya Colony, Uganda, northern Tanganyika.

Justicia.—*J. flava* Vahl ; 6500–7500 ft., erect to 6 ft., flowers yellow, in terminal spikes ; no. 142 ; widely distributed in Tropical Africa. *J. pinguior* C. B. Clarke ; 6500–7500 ft., erect to 2 ft., flowers purple in distant whorls, no. 27 ; subtropical forests of Kenya Colony westwards to Ruwenzori. *J. striata* (Klotzsch) Bullock* ; 7000 ft., erect to 1 ft., flowers pink, in axillary cymes, no. 242 ; Kenya Colony westwards to Ruwenzori, and southwards to Nyasaland, and again westward to Angola. *J. Anselliana* (Nees) T. Anders. ; 6500–7500 ft., ground creeper with erect sterile shoots, flowers white, in small long- or short- pedunculate cymes. Nos. 34 ; 206 ; widely distributed in Tropical Africa.

Hypoestes.—*H. triflora* (Forsk.) Roem. et Schultes ; 9000 and 10,000 ft., in shade of heavy forest, spreading carpet herb to 12 in., flowers pale mauve, nos. 410 ; 410a ; East Africa westwards to the Cameroons Mt., and extending eastwards to India. *H. verticillaris* (Linn. f.) R. Br. ; 6500–7500 ft., erect to 3 ft., inflorescence paniculate, flowers white with lilac marks, nos. 78 ; 514 (parasitised by

Cuscuta kilimanjari) ; widely distributed in Tropical and South Africa, and in Arabia and Socotra.

Selaginaceae.

Hebenstreitia.—*H. dentata* Linn. ; 10,200–13,500 ft., shrub to 2 ft., leaves linear, flowers spicate, white with orange throat, nos. 373 ; 373a ; 373b ; East Africa southwards to South Africa, and westwards through Nyasaland to Angola.

Verbenaceae.

Lantana.—*L. salviifolia* Jacq. ; 5900–7500 ft., in open situations, shrub, 5 ft., leaves opposite or ternate, flowers white or mauve, in short long-pedunculate axillary spikes, nos. 103 ; 103a ; widely distributed in Tropical and South Africa, and in India.

Lippia.—*L. adoensis* Hochst. ex Schauer ; erect to 6 ft., leaves opposite, ternate or quadrate, very scabrid, flowers pale yellow, in subglobose shortly pedunculate axillary spikes, no. 109 ; widely distributed in Tropical Africa.

Clerodendron.—*C. rotundifolium* Oliv. ; 6500 ft., spreading pubescent shrub to 5 ft., flowers white, in terminal cymes, corolla-tube about 4 in. long, slender, no. 456 ; Kenya Colony and Uganda westwards to Ruwenzori and the Virunga Mountains, southwards to Nyasaland and westwards to Angola. *C. ugandense* Prain ; 6500–7500 ft., glabrous shrub to 10 ft., flowers in terminal panicles, intensely blue to pale bluish-white, corolla-tube very short, no. 1 ; Kenya Colony and Uganda.

Labiatae.

Geniosporum.—*G. paludosum* Baker ; 6500–7500 ft., erect herb, leaves ovate, densely rusty pubescent, uppermost (floral) leaves white or purple, flower-whorls forming dense cylindrical spike-like panicles, flowers pale purple, no. 30 ; grasslands of Uganda and Kenya Colony southwards to Nyasaland and Rhodesia, and westwards to Angola, and in N. Nigeria westwards to Sierra Leone.

Acrocephalus.—*A. caeruleus* Oliv. ; 6500–7500 ft., erect herb about 15 in., leaves linear-lanceolate, flower-heads corymbose, floral leaves white, flowers blue or white, nos. 91 ; 92 ; grasslands of Uganda and Kenya Colony southwards to Nyasaland, Northern Rhodesia and Katanga.

Becium.—*B. obovatum* (E. Mey.) N. E. Br. ; 6500–7500 ft., erect herb to 2 ft., leaves glabrous, entire, lanceolate to obovate-oblanceolate, flowers purple, stamens long-exserted, calyx enlarged in fruit, lower lip with 2 spiny teeth, nos. 25 ; 93 ; Kenya Colony, Uganda and Tanganyika, southwards to South Africa.

Hoslundia.—*H. opposita* Vahl ; 6500 ft., aromatic shrub to 2 ft. (attains 10–15 ft.), flowers greenish white in lax terminal panicles,

fruit-calyx globose, red, edible, no. 628; widely distributed in Tropical and South Africa, and in Madagascar.

Plectranthus.—*P. silvestris* Gürke; 6500–7500 ft., herbaceous, 6–8 ft., flowers blue, no. 151; Kenya, Aberdares, Kilimanjaro and Nyasaland. *P.* sp.; 6100 ft., erect herb to 18 in., flowers pure white, no. 566.

Coleus.—*C. Forskohlii* (Willd.) Briq.; 6500–7500 ft., shrub to 10 ft., young stems and leaves fleshy, velvety-pubescent, flowers whorled, in terminal raceme-like panicles, brilliant blue, no. 150; East Africa and the Sudan, and in Arabia. Two further species of this genus were also collected with the following notes:—6500–7500 ft., erect to 8 ft., flowers pale mauve, no. 214; 8500 ft., erect to 4 ft., flowers purple-blue, no. 268.

Aeolanthus.—*A. heliotropioides* Oliv.; 6500–7500 ft., near rocks, a slightly pubescent erect herb, flowers light mauve, in panicles of one-sided spikes, calyx circumcissile in fruit, no. 446; Kenya Colony and Uganda, westwards to N. Nigeria. *A. repens* Oliv.; 6500–7500 ft., a densely pubescent herb creeping over rocks, flowers arranged as above, on shoots up to 1 ft. high, flowers purple, bracts, etc., purplish-mauve, much more glandular than in the preceding, nos. 29; 84; Kenya Colony and Uganda westwards to the Virunga Mts., and Bukoba.

Pycnostachys.—*P. deflexifolia* Baker; 6500–7500 ft. erect to 4 ft., inflorescence solitary spiciform, flowers pale mauve, calyx-teeth produced into prickles in fruit, no. 134; hills and plateaux surrounding Lake Victoria, and Lake Elmeteita. *P.* sp.; 6500–7500 ft., in one swamp (abundant), erect to $3\frac{1}{2}$ ft., inflorescence paniculate, spiciform, flowers sky blue, no. 19.

Micromeria.—*M. abyssinica* Benth.; 6500–7500 ft., erect to 4 ft., leaves ovate, crenate, petiolate, flowers pale purple in slender raceme-like panicles, no. 125; East Africa and Arabia. *M. biflora* Benth.; 10,000 ft., virgate shrublet, 18 in., leaves entire, ovate, subsessile, flowers mauve, in crowded axillary cymes, no. 303a, widely distributed in Tropical and South Africa, extending to India.

Calamintha.—*C. simensis* Benth.; 8000 ft., semi-procumbent aromatic herb, flowers purple, in whorls, no. 40; East African highlands, Virunga Mts., Cameroons Mt and Fernando Po. *C. elgonensis* Bullock*; 12,000 ft., aromatic, erect to 3 ft., woody, flowers mauve, no. 364. *C. kilimandschari* Gürke; 13,000–13,500 ft., herb to 6 in. high, Tweedie 3; Kilimanjaro, Shira Mts., Kenya, Aberdares.

Salvia.—*S. nudicaulis* Vahl; aromatic rosette herb to 1 ft., basal leaves linear-oblong, long petiolate, rugose above, softly pubescent below, flowers blue-mauve, no. 307a; Eritrea, Somaliland, Abyssinia,

Aberdares, Kenya, Mau, and in Arabia. *S. nilotica* Vahl ; 8000–8500 ft., aromatic herb like the last, to 3 ft., lower leaves lyrate, flowers purple, no. 55 ; 294 ; East Africa, southwards to Rhodesia.

Nepeta.—*N. azurea* R. Br. ex Benth. ; 10,100 ft., bushy, aromatic, to 5 ft., leaves rugose above, densely white-pubescent below, flowers rich purple, in narrow spiciform terminal panicles, no. 466 ; Abyssinia, Kenya Colony.

Scutellaria.—*S. paucifolia* Baker ; 6500–7500 ft., erect herb to 10 in., flowers purple (when growing in burnt grassland, the leaves on the flowering shoots are reduced, and may be entirely wanting), no. 69 ; widely distributed in the grasslands of Tropical Africa.

Leucas.—*L. tricrenata* Bullock* ; 8600 ft., thinly pilose semi-procumbent spreading herb, to 12 in., leaves small, obovate, 3-toothed near the apex, flowers white, in two or three whorls, no. 471 ; Nandi Forest. *L. calostachys* Oliv. ; 6500–7500 ft., densely pubescent herb, erect to 2 ft., leaves obovate to suborbicular, crenate in the upper half, flowers white, whorls numerous, spiciform, no. 74 ; Nandi westward through Uganda, then southward to Karagwe (Bukoba).

Leonotis.—*L. velutina* Fenzl. ; 6500–7500 ft. (very common), erect to 12 ft., flowers orange or deep salmon, in distant large many-flowered whorls, no. 113 ; East Africa southward to Nyasaland, Rhodesia southern Belgian Congo.

Tinnea.—*T. aethiopica* Kotschy et Peyr. ; 6500 ft. (uncommon at this altitude) erect shrub to 8 ft., flowers solitary, axillary, deep maroon, fruit calyx bladder-like, no. 452 ; Sudan, Kenya Colony, Uganda westwards to N. Nigeria and southwards to Nyasaland.

II.—*Monocotyledones.*†

Alismataceae.

Alisma.—*A. Plantago-aquatica* Linn. ; 6400 ft., an erect pond weed, up to 2½ ft. above the water surface, flowers paniculate, white, no. 532 ; widely distributed, but absent from South America.

Liliaceae.

Asparagus.—*A. racemosus* Willd. ; 6000 ft., spreading, to 4 ft., thorny, flowers racemose, green, no. 506 ; widely distributed in Tropical Africa, and in Tropical Asia. A further specimen of this genus, no. 488, was collected at 11,800 ft. ; it is thornless, and near to *A. africanus* Lam., but it cannot be determined accurately without flowers.

Dracaena.—*D. fragrans* (Linn.) Gawl. ; 6500–7500 ft., tall lily-like plant 6–8 ft., flowers reddish-mauve (to white or orange), Jackson

† Arranged approximately according to the system to be proposed by Mr. J. Hutchinson in the second volume of his *Families of Flowering Plants.*

338 (" Nasabombiondet ") ; widely distributed in Tropical Africa, and attaining 20–30 ft. in height.

Kniphofia.—*K. Snowdenii* C. H. Wright ; 6500–13,000 ft., erect " Red-hot poker " plant 2–10 ft., decreasing in size with increasing altitude, flowers yellow to red, perianth scaly-pubescent outside, Nos. 83 ; 431 ; 431a. *K. Thomsoni* Baker ; 12,000–13,000 ft., in moist ground, herb 2–3 ft., flowers glabrous, Tweedie 104 ; Kenya Colony, Kigezi, Kilimanjaro.

Aloe.—*A. elgonica* Bullock* ; 6500–7500 ft., erect to 4 ft., flowers orange-scarlet, capsules brown, no. 299.

Eriospermum.—*E. abyssinicum* Baker ; 6600 ft., large bulb, flowers yellowish-green, before the leaves, racemes erect to 8 in., no. 562 ; East Africa southwards to S. Rhodesia, and westwards through the Sudan to N. Nigeria.

Bulbine.—*B. asphodeloides* (Linn.) Schultes f. ; 6500 ft., bulbous, erect to 9 in., leaves linear, flowers bright yellow, in a dense raceme, no. 591 ; East Africa and the Sudan southwards to Nyasaland and Portuguese East Africa, and widely distributed in S. Africa.

Anthericum.—*A. uyuiense* Rendle ; 6400 ft., bulbous herb, erect to 12 in., flowers racemose, white, leaves linear, with purple spots at the base, no. 636 ; Bunyoro, and in Tanganyika Territory. *A. speciosum* Rendle ; 6500–7500 ft., erect bulbous herb to 2 ft., flowers racemose, dull white, no. 28 ; also in Uganda, Jur-land, and N. Nigeria ; this differs from the type in the spotted leaf base and rather narrower leaf. *A. angustifolium* Hochst. ex A. Rich. ; 6500 ft. bulbous herb, flowers 2–3 in., a sessile corymb, white with green veins, leaves narrowly linear, up to 5 in. long, no. 592 ; Abyssinia, Aberdares.

Chlorophytum.—*C. gallabatense* Schweinf. ex Baker ; 6300 ft., bulbous herb with spreading panicle of greenish-white flowers 2 ft. high, leaves narrowly lanceolate, about 18 in. long, no. 630 ; East Africa southwards to Nyasaland and Portuguese East Africa, and westwards to the central Chari region. *C. ciliatum* Baker ; 6750 ft., panicles erect to 7 in., flowers green, leaves rather broadly lanceolate, ciliate, up to 6 in. long, no. 559 ; Nandi, Jur-land, Central Chari, N. Nigeria and Sierra Leone. *C. elgonense* Bullock* ; 6500 ft., bulbous herb to 8 in., flowers white, leaves oblong-lanceolate, panicles simple or slightly branched, no. 629.

Drimia.—*D. congesta* Bullock* ; 8700 ft., bulbous herb to 3 ft., leafless at flowering time, racemes cylindrical, congested, flowers cream with mauve lines, no. 474. *D. elgonica* Bullock* ; 6700 and 6900 ft., erect bulbous herb to 3 ft., leafless at flowering time, racemes lax, flowers dirty white with mauve throat, nos. 563 ; 569.

Albuca.—*A. Wakefieldii* Baker ; 6500–7500 ft., bulbous herb about 1 ft. high, racemes lax, flowers green or yellowish green, leaves broadly linear, about 1 ft. long, nos. 88 ; 443 ; 560 ; East Africa, Nyasaland, Rhodesia.

Urginea.—*U. altissima* (Linn. f.) Baker ; 6900 ft., bulbous herb, erect to 6½ ft., racemes very long, pedicels up to 1 in. long, flowers white with maroon stripes outside, no. 558 ; widely distributed in Tropical and South Africa, excluding Abyssinia, Somaliland, etc. *U. porphyrantha* Bullock* ; 6500 ft., bulbous herb about 6 in., flowers maroon, no. 556.

Ornithogalum.—*O. gracillimum* R. E. Fries ; 6600 ft., small bulbous herb to 4 in., leaves linear-filiform, flowers few on a slender peduncle, white, no. 561 ; Kenya, Mau.

Scilla.—*S. indica* Baker ; 6600 ft., erect bulbous herb to 15 in., racemes long and slender, leaves puce-spotted, flowers puce, no. 557 ; eastern Tropical Africa, and in Peninsular India and Ceylon.

Androcymbium.—*A. melanthioides* Willd. ; 6600 ft., a bulbous herb about 3 in., flowers white, surrounded by green-veined white bracts, no. 555 ; Abyssinia southward through Kenya Colony, Tanganyika, Portuguese East Africa, Nyasaland and Rhodesia to the Cape.

Gloriosa.—*G. virescens* Lindl. ; 6500 ft., twining, leaves with a long circinnately curled acumen (tendril), flowers large, yellow and red, no. 63 ; widely distributed in Tropical Africa and in Natal and Madagascar.

Dioscoreaceae.

Dioscorea.—*D. Schimperiana* Hochst. ex Kunth ; 6500–7500 ft., a creeper or twiner, leaves cordate-ovate with reticulate venation, no. 453 ; widely distributed in Tropical Africa. *D. Quartiniana* A. Rich. ; 6500 ft., twining trailer, leaves palmately 3–5-foliolate, flowers (♂) cream in bracteate axillary spikes 1–2 in. long, no. 674 ; widely distributed in Tropical Africa.

Amaryllidaceae.

Haemanthus.—*H. multiflorus* Martyn ; 6000–7000 ft., bulbous herb about 1 ft., flowers scarlet, very numerous, in a dense globose umbel up to 8 in. diam., no. 578 ; East Africa westwards to Sierra Leone, etc., and southwards to Delagoa Bay.

Crinum.—*C. heterostylum* Bullock* ; 7700 ft., bulbous herb up to 9 in., with flat ribbon-like leaves, scape flattened, bearing an umbel of 5–10 straight, narrowly tubular flowers about 3 in. long, with lanceolate segments about 1 in. long, flowers at first white or cream, becoming pink later, no. 421. *C. Kirkii* Baker ; 6500–7500 ft. (?), bulbous herb to 3 ft., flowers tubular, curved, tube 4 in. or more,

limb bell-shaped, up to 4 in. long, white with broad keels of bright red, no. 579 ; Kenya Colony, Uganda and Tanganyika.

Hypoxidaceae.

Hypoxis.—*H. multiflora* Nel ; 6700 ft., erect to 9 in., flowers (before leaves) racemose, numerous, peduncle stout, bright yellow, no. 550. *H. urceolata* Nel ; 6800 ft., erect to 8 in., leaves long, linear, flowers racemose, few, on a slender peduncle, bright yellow, no. 597 ; Uganda, Tanganyika Territory (Ufiume Mt.).

Iridaceae.†

Morea.—*M. Thomsoni* Baker ; 6750 ft., erect herb to 9 in., flowers mauve, no. 573 ; Kenya Colony southwards to Nyasaland. *M. Carsoni* Baker ; 6600 ft., erect herb to 2 ft., flowers purplish-blue, said to be very poisonous to stock, no. 548 ; Kenya Colony southwards to Nyasaland.

Romulea.—*R. ramiflora* Ten. ; 13,600 ft., erect herb, 6 in., from a small globose corm, flowers plain mauve, no. 308a ; Mediterranean Region and Abyssinia. *R. Fischeri* Pax ; erect herb, 2 in., from a small globose corm, flowers mauve-blue with yellow centre, no. 352 ; Kinangop, Abori, and the Uganda side of Mt. Elgon.

Aristea.—*A. alata* Baker ; 8700 ft., erect herb to 3 ft., peduncle winged, flowers purple-mauve, no. 475 ; East Africa.

Dierama.—*D. vagum* N. E. Br. ; 11,500 ft., erect herb to 4 ft., inflorescence branches slender, wiry, flowers mauve, pendulous, nos. 337 ; Kenya.

Gladiolus.—*G. Quartinianus* A. Rich. ; 6500–11,500 ft., erect herb 2½–6 ft., flowers large, spicate, buff-yellow, salmon or scarlet, nos. 10 ; 280 ; 584 ; an extremely polymorphic species, widely distributed in Tropical Africa.

Musaceae.

Musa.—*M. Ensete* Gmel. (?) ; 6500 ft., erect to 15 ft., leaves up to 15 ft., nos. 646a ; 646b ; Abyssinia, Niamniam, Monbuttu, Uganda and probably also in the Karagwe and Kilimanjaro districts of Tanganyika. In the absence of seeds, it is impossible to identify the species with certainty, though the locality indicates the above determination.

Hydrocharitaceae.

Hydrilla.—*H. verticillata* (Linn. f.) Royle ; 6400 ft., pond weed on surface of water, flowers white, no. 534 ; widely distributed, but absent from America.

†A further Iridaceous plant which occurs on Mt. Elgon, and for which Major Lugard searched but was unable to find, is *Oenostachys dichroa* Bullock, which flowers in August at an altitude of about 10,000 ft. The rather small green and white flowers are almost completely hidden by the large, brightly coloured bracts.

Commelina.—*C. nudiflora* Linn. ; 6500–7500 ft., weak rambling herb with ovate leaves and blue flowers, no. 213 ; a weed of tropical and warm temperate regions. *C. imberbis* Hassk. ; 6500–7500 ft., weak spreading herb to 2 ft., leaves long, linear-lanceolate, flowers blue, no. 213a ; East and South Tropical Africa, extending to Madagascar. *C. africana* Linn. ; 6500–7500 ft., spreading herb to 2 ft., leaves ovate, flowers yellow, no. 212 ; widely distributed in Tropical and South Africa, and in the Mascarene Islands. *C. elgonensis* Bullock* ; 6700 ft., appearing after grass fires, erect viscid herb to 6 in., leaves ovate-lanceolate, flowers long-pedicellate, bluish-mauve, no. 549. *C. Lugardii* Bullock* ; 8000 ft., trailing herb rooting at the nodes and throwing up erect flowering shoots, leaves linear-subulate, flowers buff-orange, no. 145.

Aneilema.—*A. sinicum* Lindl. ; 6500 ft., erect herb to 2 ft., flowers paniculate, bluish-mauve, nos. 455 ; 619 ; widely distributed in Tropical and South Africa, extending through Asia to southern China.

Cyanotis.—*C. hirsuta* Fisch. et Mey. ; 8500 and 11,500 ft., creeping or suberect bog plant, leaves oblong-lanceolate, flowers purple or magenta and blue, in heads, nos. 269 ; 378 ; East Africa and probably also in Nyasaland. *C. lanata* Benth. ; 6500–7500 ft., on rocks, a lanate creeping or suberect herb, stems purple, leaves ovate to oblong-lanceolate, flowers purple, in heads, no. 118 ; widely distributed in Tropical Africa.

Orchidaceae. (V. S. Summerhayes).

Holothrix.—*H. elgonensis* Summerh.* ; 10,200 and 10,500 ft., erect to 12 ins., flowers small, white with pink flush, leaves basal, adpressed to ground, nos. 379 ; 379a.

Brachycorythis.—*B. grandis* Kraenzl. var. *ugandensis* Braid ; erect, glabrous, leafy, to 18 in. with mauve flowers, no. 661 ; also on the Uganda side of Mt. Elgon. *B. Kassneriana* Kraenzl. ; 6700 ft., erect, leafy, to 18 in. with softly velvety leaves and mauve flowers, Tweedie 14 ; Uganda southwards to Nyasaland, N.W. Rhodesia and Angola.

Habenaria.—*H. macrura* Kraenzl. ; 6700 ft., erect to 18 ins., 2 oval basal leaves, flowers green and white, scented, Tweedie 32 ; westwards to N. Nigeria and southwards to Livingstone Mts., N. Rhodesia and Angola. *H. malacophylla* Rchb. f. ; 6700 ft., erect to 2½ ft., leaves broad, flowers small, green, Tweedie 26 ; general in forests throughout Tropical Africa, southwards to Natal and E. Cape Province. *H. splendens* Rendle ; 6700 ft., erect to 18 in., flowers green and white, large, lip fimbriate, faintly scented, Tweedie 17 ; Uganda side of Mt. Elgon, Kenya, southwards to Nyasaland. *H. ruwenzoriensis* Rendle ; 6700 ft., erect to 18 in., flowers green, Tweedie 18 ; N. Nigeria, Ruwenzori. *H. Walleri* Rchb. f. ; 6700 ft., erect to 3 ft.,

flowers large, white and green, in few flowered spikes, spur very long, scented, Tweedie 9; general in grasslands and swamps in Tropical Africa. *H. Tweedieae* Summerh. MS.; 6700 ft., erect to 2 ft., flowers greenish in a rather dense spike, bracts and flowers somewhat hairy, Tweedie 25. *H. Hochstetteriana* Kraenzl.; 6700 ft., erect, 6–14 in., flowers small, greenish-white, leaves narrow, Tweedie 13; Abyssinia, Kenya, Uganda side of Mt. Elgon, N. Tanganyika. *H. ingrata* Rendle; 6700 ft., erect to 12 in., flowers green, tubers 1 in. long, no. 110; Ruwenzori. *H. limnophila* Summerh.; 6500 ft., erect to 3 ft., flowers white and green, spreading, no. 673; Kenya Colony, Uganda, N. Tanganyika, and westwards to N. Nigeria. *H. Linderi* Summerh.; 8500 ft., erect to 16 in., flowers green, erect, no. 270; western Uganda. *H. Petitiana* (A. Rich.) Dur. et Schinz; 6700 ft., erect, 8–12 in., leaves ovate, flowers very small, green, in narrow spike, Tweedie 21; Abyssinia, Uganda side of Mt. Elgon.

Platycoryne.—*P. montis-Elgon* (Schlect.) Summerh.*; 6600 ft., erect ground orchid to 8 in., flowers clustered, bright orange, no. 647; also on the Uganda side of Mt. Elgon.

Disa.—*D. concinna* N. E. Br.; 7000 ft., erect ground orchid to 15 in., flowers pale mauve, pink or purple, no. 594; E. Uganda and Kenya Colony, southwards to Nyasaland and Rhodesia. *D. Stairsii* Kraenzl.; 10,300 ft., erect, to 18 in., flowers pink, Tweedie 29; Virunga Mts., Ruwenzori, Kilimanjaro, Uluguru Mts.

Satyrium.—*S. Carsoni* Rolfe; 6600 ft., erect, with large white flowers and basal leaves appressed to ground, no. 670; Uganda and N. E. Rhodesia. *S. crassicaule* Rendle; 8250 ft., in streams, erect to 4 ft., flowers bright pink, leaves basal, erect, no. 424; Kenya, Ruwenzori and Virunga Mts., and widely distributed in Tanganyika. *S. sceptrum* Schlect.; 8600 ft., erect, 15–30 in., flowers salmon, leaves erect from separate shoots, no. 279; also in southern Tanganyika. *S. sacculatum* (Rendle) Rolfe; 6500 ft., erect to 3 ft., flowers red or orange, leaves sheath-like, no. 664; westwards to Ruanda, Virunga, Ruwenzori and Cameroons, and southwards to Nyasaland. *S. dizygoceras* Summerh.*; about 7000 ft., erect to 18 in., flowers green, leaves sheath-like, no. 595; also in Nigeria.

Polystachya.—*P. nigrescens* Rendle; 9000 ft., erect epiphyte to 12 in., flowers green, paniculate, no. 479; Ruwenzori and Nyasaland. *P. stricta* Rolfe; 6500 ft., epiphyte on wild Olive tree, flowers greenish-yellow, paniculate, no. 564; Kenya Colony and Uganda. *P. Adansoniae* Rchb. f.; 6000 ft., epiphyte, flowers yellowish-green, no. 625; Gold Coast, Cameroons, Angola. *P. Steudneri* Rchb. f., 6700 ft., erect epiphyte to 12 in., flowers yellow in short lateral racemes, no. 504; also in Abyssinia. *P. ruwenzoriensis* Rendle; 6600 ft., epiphyte, erect to 9 in., flowers racemose, green, no. 640; Ruwenzori. *P. spatella* Kraenzl.; 7000 ft., epiphyte, flowers yellowish-green, racemose, no. 274; Ruwenzori and Virunga Mts.

Lissochilus.—*L. pyrophilus* Rchb. f.; 6750 ft., erect to 7½ in., flowers buff with pink stripes, no leaves at flowering time, no. 540; western Kenya Colony, western Uganda and southern Sudan. *L. mediocris* Rendle; 6900 ft., erect to 2 ft., flowers mauve, appearing before the leaves, no. 572; Uganda, Imatong Mts. *L. arenarius* Lindl.; 6000–7000 ft., erect to 2½ ft., flowers pale to bright purple, with very young leaves, no. 596; widely distributed in the grasslands of Tropical Africa. *L. Elliotii* Rendle; 6000 ft., erect, 4–8 ft., large broad leaves and purple flowers, no. 441; Kenya and Aberdares westward to Ruwenzori. *L. porphyroglossus* Rchb. f.; 6000 ft., in swamp, erect to 9 ft., flowers purple, leaves broad, no. 662; Monbuttu, Niam-niam, Uganda, Zanzibar. *L. ruwenzoriensis* Rendle; 6500–6800 ft., erect to 18 in., flowers yellow, leaves about 1 in. wide, no. 635; Uganda westward to Ruwenzori and Virunga Mts. *L. Oliverianus* Rchb. f.; 7000–8000 ft., erect to 4 ft., flowers yellow, before the leaves, no. 87; S. Kenya Colony, Uganda, Bukoba, Virunga Mts. *L. bellus* (N. E. Br.) Schlect.; 6500–7500 ft., erect to 4 ft., flowers red and yellow, leaves obtuse, emarginate, nos. 11; 11a; 11b; Uganda, Kenya Colony and Zambeziland. *L. Wakefieldii* Rchb. f. et S. Moore; 6000 ft., in swamp, erect to 4 ft., flowers bright yellow, leaves acute, no. 585; Sudan, Uganda, Kenya Colony and Zambeziland.

Eulophia.—*E. montis-Elgonis* Summerh.*; erect to 2½ ft., flowers pinky-mauve, leaves very long and acute, no. 663. *E. milanjiana* Rendle; 6200 ft., erect to 2½ ft., flowers yellow with chocolate and bright yellow throat, no. 634; southern Sudan and Uganda southwards to Nyasaland and Portuguese East Africa.

Pteroglossaspis.—*P. ruwenzoriensis* (Rendle) Rolfe; 6700 ft., erect to 18 in., flowers maroon, no. 665; Kenya Colony westwards to Ruwenzori.

Diaphananthe.—*D.* sp.; 6700 ft., an epiphyte with short stem and spikes of medium sized whitish flowers, Tweedie 10; this is probably an undescribed species.

Chamaeangis.—*C. odoratissima* Schlect.; 6700 ft., an epiphyte with elongated leafy stem, flowers small, in whorls of 3–4 on a long slender spike, Tweedie 24; Cameroons, Congo, Uganda.

Aerangis.—*A. Thomsoni* (Rolfe) Schlect.; 8650 ft., epiphyte, about 5 slightly scented white flowers on each raceme, spur about 5 in. long, leaves broad, no. 468; Leikipia Plateau and the Uganda side of Mt. Elgon. *A. floribunda* (Rolfe) Summerh.*; 6600 ft., epiphyte with scented white flowers which become orange when old, leaves narrow, bilobed at the apex, no. 645; Uganda.

Cyrtorchis.—*C. Whytei* (Rolfe) Schlect.; 6600 ft., epiphyte, stem somewhat elongated, leaves bilobed at the apex, flowers faintly

scented, large, white, with very acute reflexed segments, no. 565 ; the Uganda side of Mt. Elgon, and in Nyasaland.

Tridactyle.—*T. fimbriata* Schlect. ; 6700 ft., an epiphyte with an elongated leafy stem, and lax spikes of small orange flowers, Tweedie 23 ; Uganda, W. Kenya, N. Tanganyika.

Araceae.

Arisaema.—*A. ruwenzoricum* N. E. Br. ; 6800 ft., erect to 3 ft., leaves digitate, at same time as flowers, leaf-segments entire, spathe green with white stripes, no. 633 ; Aberdares, Kikuyu, Limuru, Ruwenzori.

Amorphophallus.—*A. Schweinfurthii* (Engl.) N. E. Br. ; 6000–6500 ft., uncommon, erect to 15 in., flowers before the leaves, leaf segments pinnatipartite, spathe dark claret-coloured, with strong green veins on the back, no. 581 ; Kenya Colony, Uganda and Sudan westwards to the northern Cameroons, and also (*ex* Engler) in Tanganyika Territory.

Sauromatum.—*S. nubicum* Schott ; 6700 ft., uncommon, stem 8 in., deep maroon, spathe 10 in., pale yellow with maroon markings, appearing before the pedatisect leaves, no. 580 ; Abyssinia and Eritrea southwards to Nyasaland.

Typhaceae.

Typha.—*T. australis* Schum. et Thonn. ; 6400 ft., a bulrush, erect to 3 ft. above the water, flowers brown, no. 533 ; widely distributed in Tropical and South Africa.

Juncaceae.

Luzula.—*L. Johnstonii* Fr. Buch. ; 13,000 ft., a rush up to 2 ft. high, no. 682 ; Kilimanjaro, Shira, Virunga Mts. and Ruwenzori.

Eriocaulonaceae.

Eriocaulon.—*E. Friesiorum* Bullock* ; 10,200 ft., rosette herb with linear leaves, flowers black and white, capitate on peduncles up to about 1 ft. high, no. 683 ; Aberdares.

Cyperaceae. (E. Milne-Redhead).

Kyllinga.—*K.* sp. ; 6500–7500 ft., dwarf erect rush 5 in. high, flowers brown, no. 120. This is probably *K. pinguis* C. B. Cl., but accurate identification is impossible in the absence of the rootstock.

Cyperus.—*C. eucentinigricans* K. Schum. ; 8600 ft., erect plant up to 2 ft. high, spikelets rich brown, no. 463 ; East Africa. *C. dichroostachyus* Hochst. ex A. Rich. ; 9000 ft., erect plant up to 2 ft. high, spikelets black and green, no. 467 ; eastern and southern Tropical Africa, Madagascar and Yunnan. *C. distans* Linn. f. ;

6500–7500 ft., erect rush up to 2½ ft. high ; spikelets brown and green, no. 184 ; tropics generally. *C. Fischerianus* Schimper ex A. Rich. ; 6500 ft., on margin of forest, a plant with triangular stem with smooth dark surface, trailing over bushes, no. 620 ; East Africa.

Mariscus.—*M. longibracteatus* Cherm. var. *subdistans* Kukenth. ; 6500–7500 ft., erect rush, 2 ft. high, spikelets green, no. 185 ; Kenya Colony and Uganda. *M.* sp., 6500–7500 ft., dwarf erect rush, 4 in. high ; spikelets white, no. 121 ; this specimen is possibly *M. mollipes* C. B. Cl. but it is too poor to identify with certainty.

Scleria.—*S.* sp., 6700 ft., erect rush, up to 1·5 ft. high, no. 667 ; specimen too poor for identification.

Carex.—*C. Petitiana* A. Rich., about 9000 ft., erect sedge 3 ft. high ; inflorescence brown, no. 482. Abyssinia and East African mountains. *C. simensis* Hochst. ex A. Rich. ; 13,000 ft., erect rush up to 1½ ft. high, no. 680 ; Abyssinia, East African mountains and Cameroons Mt.

Gramineae. (C. E. Hubbard).

Arundinaria.—*A. alpina* K. Schum. ; 8300–10,000 ft., erect bamboo to 35 ft., with hollow culms, no. 480 ; forming extensive forests on the mountains of Kenya Colony, Uganda, Tanganyika and eastern Belgian Congo.

Eragrostis.—*E. hispida* K. Schum. ; 6700 ft., low densely tufted perennial with silvery-green hairy panicles, no. 666 ; Kenya Colony and Uganda southwards to Rhodesia. *E. Taffzagra* Steud. ; 6700 ft. tufted perennial with large loose glabrous panicles of large ovate or oblong spikelets, no. 604 ; East Africa. *E. chalcantha* (Kunth) Trin. ; 6700 ft., small tufted perennial with narrow panicles of small greyish or olive-green ovate spikelets, no. 607 ; East Africa southwards to the Cape, and in Arabia. *E. tenuifolia* Hochst. ; 6700 ft., tufted perennial with a lax glabrous panicle of very narrow spikelets. no. 612 ; East Africa and the Sudan.

Agrostis.—*S. Schimperiana* Hochst. ; 13,000 ft., perennial with contracted panicles of minute green or purple spikelets, no. 681 ; East Africa.

Sporobolus.—*A. Stapfianus* Gandoger ; 6700 ft., slender tufted perennial with delicate lax panicles, no. 606 ; Tropical and South Africa. *S. filipes* Stapf MS. ; 6600 ft., perennial with large, loose, lax panicles, no. 676 ; Kenya Colony and Uganda. *S. indicus* (Linn.) R. Br. ; 6500 ft., densely tufted perennial with more or less contracted narrow panicles, no. 675 ; Tropical and South Africa, and in Tropical America. *S. capensis* (Willd.) Kunth ; densely

tufted perennial with narrow spike-like panicles, s.n. ; Kenya Colony and Uganda southwards to the Cape.

Cynodon.—*C. Dactylon* (Linn.) Pers. ; 6700 ft., creeping perennial with long runners and rhizomes and erect flowering culms bearing at the apex slender digitate spikes, no. 603 ; tropical and warm temperate regions.

Trichopteryx.—*T. simplex* (Nees) Hack. ; 6700 ft., densely tufted perennial with lax dark brown awned panicles, no. 668 ; Kenya Colony southwards to South Africa.

Echinochloa.—*E. stagnina* (Retz.) P. Beauv. ; 6500 ft., in and near water, perennial with long creeping fleshy rhizomes and secund inflorescences, no. 672 ; Tropical and South Africa, and in Tropical Asia.

Setaria.—*S. sphacelata* (Schum.) Stapf et C. E. Hubbard ; 6700 ft., tufted perennial with spike-like bristly inflorescences, the bristles mostly orange, no. 605 ; Tropical and South Africa.

Brachiaria.—*B. brizantha* (Hochst.) Stapf ; 6700 ft., tufted perennial with an inflorescence of secund spike-like racemes, the latter glabrous or fringed with white hairs, no. 611, Tropical and South Africa. *B. soluta* Stapf ; 6700 ft., loosely tufted perennial, racemes fringed with yellow hairs, no. 609 ; Kenya Colony, Uganda, Tanganyika and Belgian Congo.

Digitaria.—*D. scalarum* (Schweinf.) Chiov. ; perennial with long creeping rhizomes and linear leaf-blades, s.n. ; East Africa. *D. velutina* (Forsk.) Beauv. ; 6700 ft., tufted annual with linear to narrowly lanceolate leaf-blades, no. 610 ; Tropical and South Africa and in Arabia, Mascarene Islands, India and Tropical America.

Pennisetum.—*P. clandestinum* Hochst. ; 6700 ft., perennial with long creeping stolons and rhizomes, the inflorescence much reduced and for the most part enclosed in the uppermost leaf-sheath, a good grazing grass, no. 602 (" Kikuyu grass ") ; East Africa.

Rhynchelytrum.—*R. roseum* (Nees) Stapf et C. E. Hubbard ; 6700 ft., annual or perennial with pink, red or white panicles of densely hairy spikelets, no. 601 ; Tropical and South Africa.

Hyparrhenia.—*H.* sp. near *H. formosa* Stapf ; 6700 ft., perennial, to 5 ft., with large spatheate panicles, spathes reddish-brown, no. 613.

Themeda.—*T. triandra* Forsk., var. *punctata* (Hochst.) Stapf ; 6700 ft., densely caespitose perennial with erect culms and a spatheate panicle, the spatheoles hispid, with black tubercles, no. 608 ; East Africa.

XII—PRELIMINARY LIST OF DISEASES OF ECONOMIC PLANTS IN BRITISH GUIANA. E. B. Martyn.

A number of records of diseases which have not been observed recently have been obtained from Departmental Reports, together with certain references occurring in Nowell's " Diseases of Crop Plants in the Lesser Antilles " (referred to as " Nowell "). In the cases of such records, the observer's name, or the source of reference, is given. Some of the minor diseases mentioned in early Reports, for which there is no subsequent verification, have been omitted.

Several crops which occupied a more important position in years gone by are now but little grown, or have gone entirely out of cultivation. Cocoa and lime are now only to be found in a few areas, and cotton, rubber and sisal are represented only by isolated plants, to be met with on the sites of former plantations.

Balata (*Mimusops globosa* Gaertn.).

Die Back. Cause uncertain. (Agr. Journ. B.G. iii. 4, 231 : 1930.)

Banana (*Musa sapientum* L.).

Anthracnose. *Gloeosporium Musarum* Cooke et Mass.

Wilt Disease. *Bacterium* spp. with sometimes *Fusarium cubense* E. F. Smith associated.

Bengal Bean (*Mucuna aterrima* Holl.).

Leaf Spot. *Cercospora stizolobii* Syd.

Bean, Soya (*Glycine max* Merrill).

Pod Blight. *Phomopsis* sp. (P. sojae Lehm. ? cf. R. A. M. ii. 151 : 1923.)

Cacao (*Theobroma Cacao* L.).

Black Pod and Canker. *Phytophthora palmivora* Butl. (Recorded formerly as *P. Faberi* Maubl.)

Die back. *Botryodiplodia Theobromae* Pat. ; secondary.

Excresences. Crowded with flowers, few of which open. Described by Bartlett, 1905 ; apparently akin to " Male Cocoa."

Pink Disease. *Corticium salmonicolor* B. et Br. (Bancroft, 1915.)

Thread Blight. *Corticium Koleroga* (Cooke) v. Höhn.

Witch Broom. *Marasmius perniciosus* Stahel.

Coconut (*Cocos nucifera* L.).

Leaf Spots. *Diplodia epicocos* Cooke ; secondary.
Pestalozzia Palmarum Cooke ; secondary.

Red Ring. *Aphelenchus cocophilus* Cobb. (Stell, 1920.)

Wilt. Formerly known as " bud rot " ; due to environmental conditions.

Coffee (*Coffea* spp.).

American Leaf Disease. *Omphalia flavida* (Cooke) Maubl. et Rang. (Bancroft, 1915.)

Brown Eye Spot. *Cercospora coffeicola* Berk. et Cooke.
Phloem necrosis. *Phytomonas* sp.
Sclerotium Disease. *Sclerotium coffeicolum* Stahel.
Wilt. *Papulospora* sp. (Alston, 1925 and 1926.)

Cotton (*Gossypium* spp.).
Anthracnose. *Glomerella Gossypii* Edgert. (Recorded as *Colletotrichum Gossypii* Southw., by Bancroft, 1915).
Cotton Rust. *Kuehneola Desmium* (B. et Br.) Butl. (Recorded as *Uredo Gossypii* Lagerh., in Nowell, 283.)
Internal Boll Disease. (Described by Bartlett, 1907 ; Nowell, 263.)

Fig (*Ficus Carica* L.).
Leaf Blight. *Cercospora Bolleana* (Thüm.) Speg. (Jenman, 1901 ; first specific mention of a plant disease in Department's Records).

Grape (*Vitis vinifera* L.).
Black rot. *Guignardia Bidwellii* (Ell.) Viala et Rav. (Recorded as Anthracnose by Bancroft, 1915.)
Powdery Mildew. *Uncinula necator* (Schw.) Burr. (Recorded as *U. spiralis* B. et C. by Bancroft, 1915.)

Ground Nut (*Arachis hypogaea* L.).
Leaf Rust. *Puccinia Arachidis* Speg.
Leaf Spot. *Cercospora personata* (B. & C.) Ell. et Ev.

Lime (*Citrus aurantifolia* Swingle).
Citrus knot. *Sphaeropsis tumefaciens* Hedges. (Bancroft, 1915.)
Mal-di-Gomma. *Phytophthora parasitica* Dastur. (Nowell, 213.)
Red Root Disease. *Sphaerostilbe* sp. (Nowell, 203).
Sooty Mould. *Capnodium Citri* Berk. et Desm.
Wither Tip. *Gloeosporium limetticolum* Claus.

Maize (*Zea Mays* L.).
Smut. *Ustilago Maydis* (DC.) Corda.

Mango (*Mangifera indica* L.).
Anthracnose. *Gloeosporium Mangiferae* P. Henn.
Black Blight. *Capnodium mangiferum* Cooke et Broome.

Onion (*Allium Cepa* L.).
Downy Mildew. *Phytophthora* sp.

Orange (*Citrus sinensis* Osb.).
Damping off of seedlings. *Fusarium* sp.
Ripe Rot. *Penicillium digitatum* (Fr.) Sacc. (Recorded as *P. olivaceum* Wehmer, Bancroft, 1915.)

Papaw (*Carica Papaya* L.).
Black Leaf Spot. *Asperisporium Caricae* (Speg.) Maubl. (Recorded as *Pucciniopsis Caricae* Earle, Bancroft, 1915.)

Peppers (*Capsicum* sps.).
Anthracnose. *Colletotrichum nigrum* Ell. et Halst.

Pineapple (*Ananas comosus* Merrill).
" Black Eye." (Nowell, 349.) Cause uncertain.
Fruit Rot. *Ceratostomella paradoxa* Dade. (Recorded as *Thielaviopsis paradoxa* (de Seynes) v. Höhn).

Plantain (*Musa paradisiaca* L.).
Wilt Disease. *Bacterium* spp. with sometimes *Fusarium cubense* E. F. Smith associated.

Potato (*Solanum tuberosum* L.).
Root Knot. *Heterodera radicicola* (Greef.) Muller.

Rice (*Oryza sativa* L.).
Blast. *Piricularia Oryzae* Bri. et Cav.
" Man Rice." *Fusarium* ? *moniliforme* Sheld.
Sclerotial Disease. *Sclerotium Oryzae* Catt. (Bancroft, 1915.)
Smut. *Tilletia horrida* Tak. (Bancroft, 1915.)

Rose (*Rosa* spp).
Black Spot. *Diplocarpon Rosae* Wolf.
Crown Gall. *Bacterium tumefaciens* E. F. Sm. et Towns. (Bancroft, 1915.)
Mildew. *Sphaerotheca pannosa* (Wall.) Lév.

Rubber, Para (*Hevea brasiliensis* Muell. Arg.).
Die back. *Botryodiplodia Theobromae* Pat. (Bancroft, 1915.)
Root Disease. *Fomes lignosus* (Kl.) Bres. (Recorded as *F. semitostus* Berk. by Bancroft, 1915.)
South American Leaf Disease. *Melanopsammopsis Ulei* (P. Henn.) G. Stahel. (Also recorded as *Passalora Heveae* Mass.).

Sisal (*Agave rigida* Mill. var. *sisalana*).
Anthracnose. (*Colletotrichum Agaves* Cav.)

Sudan Grass (*Sorghum sudanense* Hitch.)
Leaf Spot. *Colletotrichum falcatum* Went.

Sugar Cane (*Saccharum officinarum* L.)
Chlorosis, non-infectious. Several types, due to environmental conditions. (Department's Reports, 1929–1930.)
Diplodia Rot. *Botryodiplodia Theobromae* Pat. (A. Howard ; Nowell, 308.)
Pineapple Disease. *Ceratostomella paradoxa* Dade (Recorded as *Thielaviopsis paradoxa* (de Seynes) v. Höhn.)
Red Rot. *Colletotrichum falcatum* Went. (Bancroft, 1915.)
Red Spot of Leaf Sheath. *Cercospora vaginae* Krüg.
Rind Disease. *Melanconium Sacchari* Mass. ; secondary.
Ring Spot. *Leptosphaeria Sacchari* v. Breda.
Root Rot. Formerly attributed to *Marasmius sacchari* Wakker and other fungi, now considered primarily due to environmental conditions.
Top Rot. *Bacterium* spp. associated. Probably a secondary disease. (Alston, Department's Reports, 1923–26.)
Twisted Top. Apparently mechanical, and non-infectious.

Sun Hemp (*Crotalaria juncea* L.).
Wilt. *Fusarium vasinfectum* Atk.

Sweet Potato (*Ipomoea Batatas* Lam).

White Rust. *Cystopus Ipomoeae-panduranae* (Schw.) Stev. et Swingle.

Tobacco (*Nicotiana Tabacum* L.)

Mosaic. Virus disease.

Tomato (*Lycopersicum esculentum* Mill.)

Blossom End Rot. Due to environmental conditions affecting water supply.

Leaf Mould Disease. *Cladosporium fulvum* Cooke.

Root Knot. *Heterodera radicicola* (Greef.) Muller.

Wilt. *Bacterium solanacearum* E. F. Smith.

Wilt. *Fusarium Lycopersici* Sacc.

XIII—MISCELLANEOUS NOTES.

Sir Daniel Morris.—It is with great regret that we record the death, on February 9th, in his eighty-ninth year, of Sir Daniel Morris, K.C.M.G., Assistant-Director of the Royal Botanic Gardens, Kew, from 1886 to 1898.

Sir Daniel was educated at Cheltenham College, the Royal College of Science, South Kensington, and at Trinity College, Dublin, where he graduated with first-class honours in 1876. The following year he was appointed Assistant to Dr. Thwaites at Peradeniya, where he remained for two years, working especially at *Hemileia vastatrix*, which was at that time threatening the coffee plantations of Ceylon. In 1879 he was appointed Director of the Public Gardens and Plantations in Jamaica, a post which enabled him to commence his life-long study of tropical economic botany, especially fruit and fibre plants, and which gave him a knowledge of West Indian conditions invaluable during his later work in that region.

During his Directorship in Jamaica, which he held for seven years, Dr. Morris, as he was then, visited British Honduras and St. Helena, publishing two valuable reports on the resources and prospects of these colonies.

In 1886 Sir Joseph Hooker retired from the Directorship of Kew, Sir William Thiselton-Dyer succeeded him and Dr. Morris was appointed Assistant-Director. During his period of office, besides writing many articles in the Kew Bulletin on various economic products, especially fibre plants (see *K.B.* 1886–1898, *passim*), he published books on "Fruit as a Factor in Colonial Commerce" (1887), which greatly stimulated interest in colonial fruits, on "The Colony of the Leeward Islands" (1891), "The Sisal Industry of the Bahamas" (1896) and on other subjects. In 1890–91 he undertook a special mission to the West Indies in order to stimulate the development of the fibre, sugar, banana and other industries; in 1895 he visited the Bahamas and in 1896 was appointed Expert Adviser on Agricultural and Botanical Questions to the West Indian Royal Commission. Following his work on this commission, which has

been described as providing " the salvation of our West Indian possessions," Dr. Morris was appointed in 1898 to the important post of Imperial Commissioner of Agriculture in the West Indian Agricultural Department.

During his Assistant-Directorship at Kew, his knowledge of overseas conditions and problems had been of the greatest service in the work being done at that time for colonial agriculture under the enlightened policy of Mr. Joseph Chamberlain at the Colonial Office.

In the " Kew Bulletin " for 1898, p. 234, there is reprinted from " The Times " an extract from Mr. Joseph Chamberlain's speech outlining the aims and scope of the new post of Imperial Commissioner and expressing his conviction that " there was no one more capable of fulfilling these aims than Dr. Morris." These aims were, briefly, to found a special public department dealing with questions of economic botany, to set up botanic stations in all the islands, and to establish fortnightly communications between them. For ten years Dr. Morris worked on these lines, paying especial attention to the improvement of sugarcane by breeding and to the introduction and cultivation of a variety of other crops, notably sea-island cotton, thus reviving an industry which had lapsed for 100 years, cocoa and limes. Other important activities which he initiated were the training of a staff of experts to advise on agricultural matters throughout the West Indies, and the establishment of intercolonial agricultural conferences which have resulted in such valuable interchange of ideas between agricultural departments.

Sir Daniel retired in 1908, having been made C.M.G. in 1893, and K.C.M.G. in 1903, but he continued to lead a busy life, acting as Scientific Adviser to the Colonial Office until 1913, and serving on the governing bodies of the Imperial Institutes of Mycology and Entomology, and the John Innes Horticultural Institution. In Bournemouth, where he settled on his retirement, he took a leading part in the life of the town, and, as President of the Bournemouth Natural Science Society, did much to encourage the study of natural history in the neighbourhood. In 1919, when the British Association met in the town, he was President of Section K.

Sir Daniel, through his work both at Kew and in the West Indies, will always be remembered as an able and indefatigable worker for the improvement of the agricultural resources of the Empire.

Botanical Magazine.—The first part of vol. clvi, published on January 2nd, 1933, contains the description of a new genus *Leptaloë* by Dr. Stapf, the type plant of which has been known as *Aloë myriacantha* Schön., and *Aloe myriacantha* var. *minor* Berger in particular. This interesting new genus, represented in t.9300, contains some seven species and the one figured, *Leptaloë albida* Stapf, comes from the Saddleback Mountain, near Barberton in the Transvaal.

Other plants figured are *Haemanthus Nelsonii* Baker (t.9293), from the high veld of the Transvaal and Orange Free State; *Aichryson dichotomum* Webb et Berth. (t.9294), an annual or biennial '*Sempervivum*' common in the Canary Islands; *Parasyringa sempervirens* W. W. Smith (t.9295), a monotypic genus confined to N. W. Yunnan and adjacent parts of Szechuan, China; *Nomocharis saluenensis* Balf. f. (t.9296), a native of the N. W. corner of Yunnan and adjoining parts of Burma and Tibet; *Daphne sureil* W. W. Smith et Cave (t.9297), a white-flowered, tender shrub, from the Sikkim Himalaya and Southern Assam; *Berberis Jamesiana* Forrest et W. W. Smith (t.9298), from N. W. Yunnan, S. Szechuan and Tibet; *Bulbophyllum patens* King ex Hook. f. (t.9299) from Malaya; *Leptaloë albida* Stapf (t.9300), already mentioned; *Rhododendron sperabile* Balf. f. et Farrer (t.9301), discovered by Farrer in 1919 in N.E. Burma; *Astragalus utahensis* Torrey et Gray (t.9302), a charming plant native of the Rocky Mountains N. America, and *Fritillaria karadaghensis* Turrill (t.9303), from the northern part of Azerbeidjan, Persia.

The Romance of Empire Drugs.*—An interesting booklet bearing this title has recently been issued by the Scientific Department of Messrs. Stafford Allen & Sons, Ltd. Although no doubt issued primarily as a means of advertising the products of the firm, the publication contains a great deal of useful information on drugs and drug-plants. As the title implies, only drugs of Empire origin are dealt with, and the main sources are clearly indicated on an outline map of the world occupying the two cover pages. Two to three pages are devoted to each of the fifty-one drugs dealt with, forty-seven of which are of vegetable origin. One of the outstanding features of the publication, and one likely to appeal particularly to the popular reader, is the number of good photographs that are included. These show the plants either growing, or in the dried state, or in some stage during the collection of the drug. The descriptive matter is presented in an attractive and readable form and bears evidence of care in its compilation, although in a few instances the botanical terminology is open to question. Special attention has been paid to early history and uses, and the information supplied under this category should prove of special interest.

The low price at which the booklet is published should favour a wide circulation, and its appearance at the present time is appropriate in view of the increasing interest taken in Empire products.

F. N. H.

* "The Romance of Empire Drugs," issued by the Scientific Department of Messrs. Stafford Allen & Sons, Ltd., Cowper Street, London, E.C. Pp. 135, ill. 64. Price 1*s.* or 9*s.* per doz.

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